SECTION 1

OVERALL MACHINE INFORMATION

1. SPECIFICATIONS

Configuration: Desktop

Copy Process: Dry electrostatic transfer system

Originals: Sheet/Book

Original Size: Maximum A3/11" x 17"

Copy Paper Size: Maximum
A3/11" x 17"
Minimum
A5/8 1/2" x 5 1/2" sideways (Paper tray)
A6/5 1/2" x 8 1/2" lengthwise (By-pass)

Copy Paper Weight: Paper tray:
60 ~ 90 g/m^2, 16 ~ 24 lb
By-pass:
60 ~ 157 g/m^2, 16 ~ 42 lb

Reproduction Ratios: 5 Enlargement and 7 Reduction

	A4/A3 Version	LT/DLT Version
Enlargement	400% 200% 141% 122% 115%	400% 200% 155% 129% 121%
Full size	100%	100%
Reduction	93% 87% 82% 71% 65% 50% 25%	93% 85% 77% 74% 65% 50% 25%

Zoom: 25% to 400% in 1% steps

Power Source: 120V/60 Hz:
More than 12 A (for North America)
220V ~ 240V/50 Hz:
More than 7 A (for Europe)
220V ~ 240V/60 Hz:
More than 7 A (for Asia)

Power Consumption:

	Mainframe Only		Full System	
	120V	220V ~ 240V	120V	220V ~ 240V
Maximum	Less than 1.1 kW	Less than 850 W	Less than 1.2 kW	Less than 1 kW
Copying	Approx. 470 W	Approx. 500 W	Approx. 500 W	Approx. 530 W
Warm-up	Approx. 1.0 kW	Approx. 750 W	Approx. 1.0 kW	Approx. 750 W
Stand-by	Approx. 130 W	Approx. 130 W	Approx. 140 W	Approx. 140 W
Auto Shut Off	Approx. 2.0 W	Approx. 2.2 W	Approx. 2.2 W	Approx. 2.4 W

NOTE: Full System: Mainframe + ADF + Paper Tray Unit + Duplex Tray + 1-bin Sorter

Noise Emission:

	Mainframe Only	Full System
1. Sound Power Level		
Copying	61.5 dB(A)	64.5 dB(A)
Stand-by	30.0 dB(A)	30.0 dB(A)
2. Sound Pressure Level at the Operator Position		
Copying	47.5 dB(A)	52.0 dB(A)
Stand-by	17.5 dB(A)	17.5 dB(A)

NOTE: The above measurements were made in accordance with ISO 7779.
Full System: Mainframe + ADF + Paper Tray Unit + Duplex Tray + 1-bin Sorter

Dimensions (W x D x H): 550 x 580 x 652 mm (21.7" x 22.9" x 25.7")
Measurement Conditions
1) With by-pass feed table closed
2) Without the optional paper tray unit
3) Without the ADF

Weight: Less than 57 kg (126 lb)

Copying Speed in Multicopy mode (copies/minute):

	A4 sideways/ 11" x 8$_{1/2}$"	A3/11" x 17"	B4/8$_{1/2}$" x 14"
No optional memory	15	9	10
With 4MB or 8MB optional memory	20	11	12

Warm-up Time
Less than 30 seconds (20°C, 68°F): 115V machine
Less then 35 seconds (20°C, 68°F): 230V machine

First Copy Time: Less than 9.8 s (from 1st paper tray to face down copy tray)
Less than 8.8 s (from 1st paper tray to face up copy tray)

Copy Number Input: Ten-key pad, 1 to 99 (count up or count down)

Manual Image Density: 7 steps

Automatic Reset: 60 s is the standard setting; it can be changed with a UP mode.

Auto Shut Off: 15 min. is the standard setting; it can be changed with a UP mode.

Copy Paper Capacity:
Paper Tray: 250 sheets
Optional Paper Tray Unit: 500 sheets x 2
Bypass: 100 sheets (A4, B5, A5, B6, 8.5 x 11", 5.5 x 8.5")
10 sheets (A3, B4, 11 x 17", 8 x 13")
1 sheet (non-standard sizes)

Toner Replenishment: Cartridge exchange (216 g/cartridge)

Toner Yield: 8 k copies (A4 sideways, 6% full black, 1 to 1 copying, ADS mode)

Optional Equipment:
- Platen cover
- Auto document feeder
- Paper tray unit with two paper trays
- 1-bin sorter
- Duplex unit
- Key counter
- Tray heater
- Optical anti-condensation heater

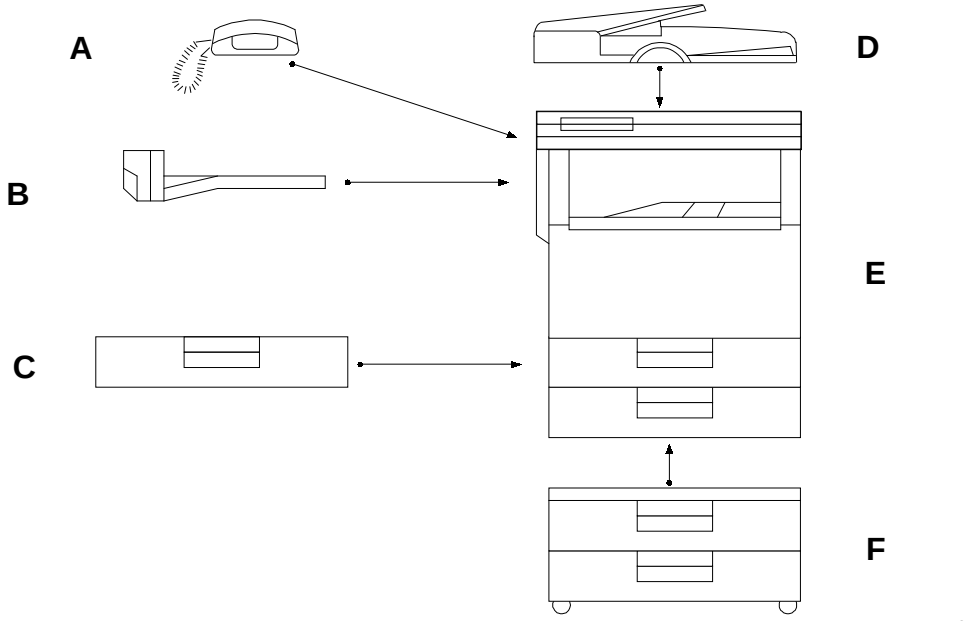
Copy Tray Capacity:
Face down mode: 500 sheets
Face up mode: 100 sheets

Memory Capacity:

		Standard (4 MB)	Optional 4 MB	Optional 8 MB
Multi duplex copy		X	O	O
Sort, Rotate Sort	A4, LT	O	O	O
	B4, LG	X	O	O
	A3, DLT	X	O	O
Number of pages	A4 6%	35	99	99
	ITU-T#4	15	45	75

X: Not AvailableO: Available

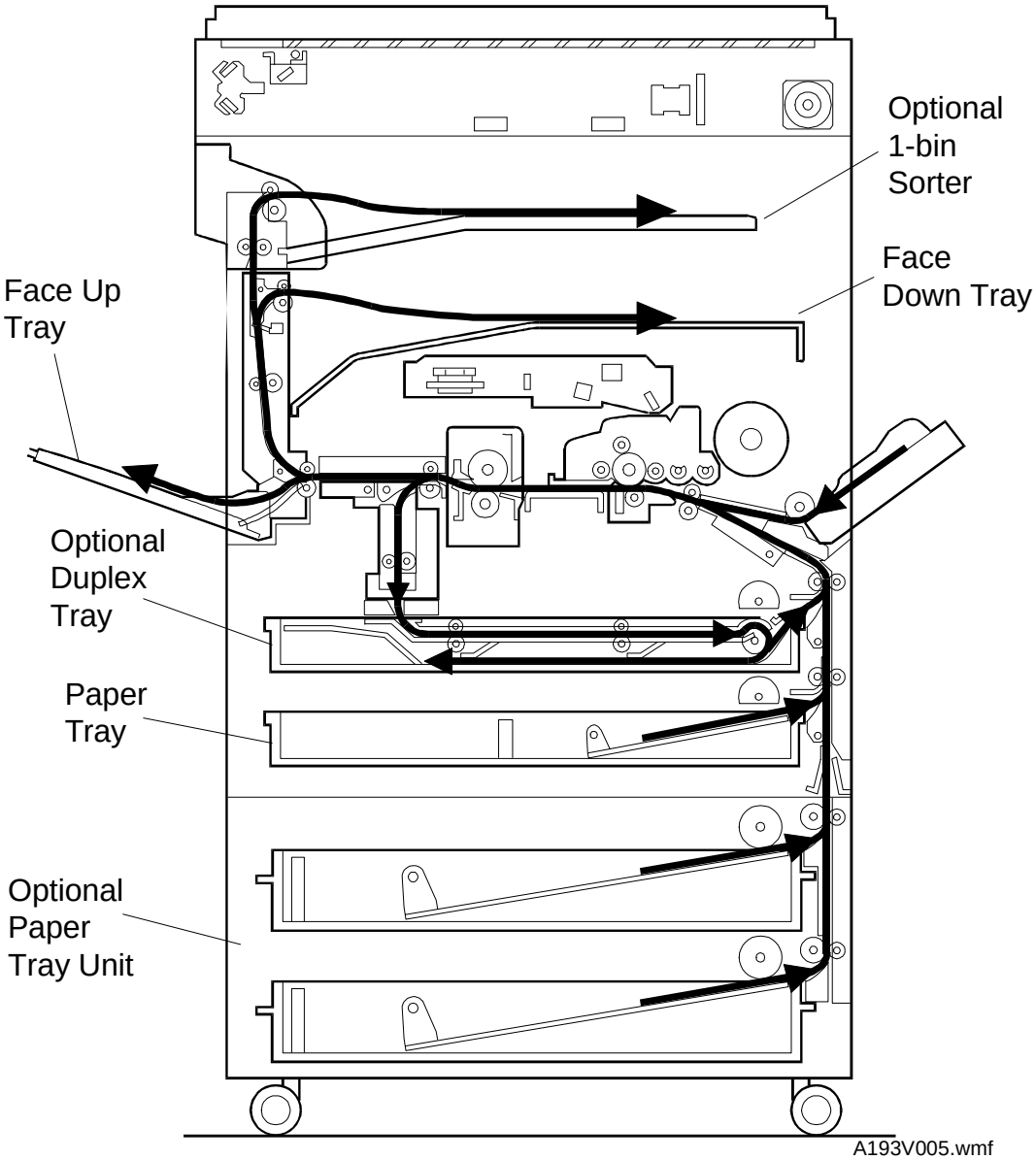
2. MACHINE CONFIGURATION



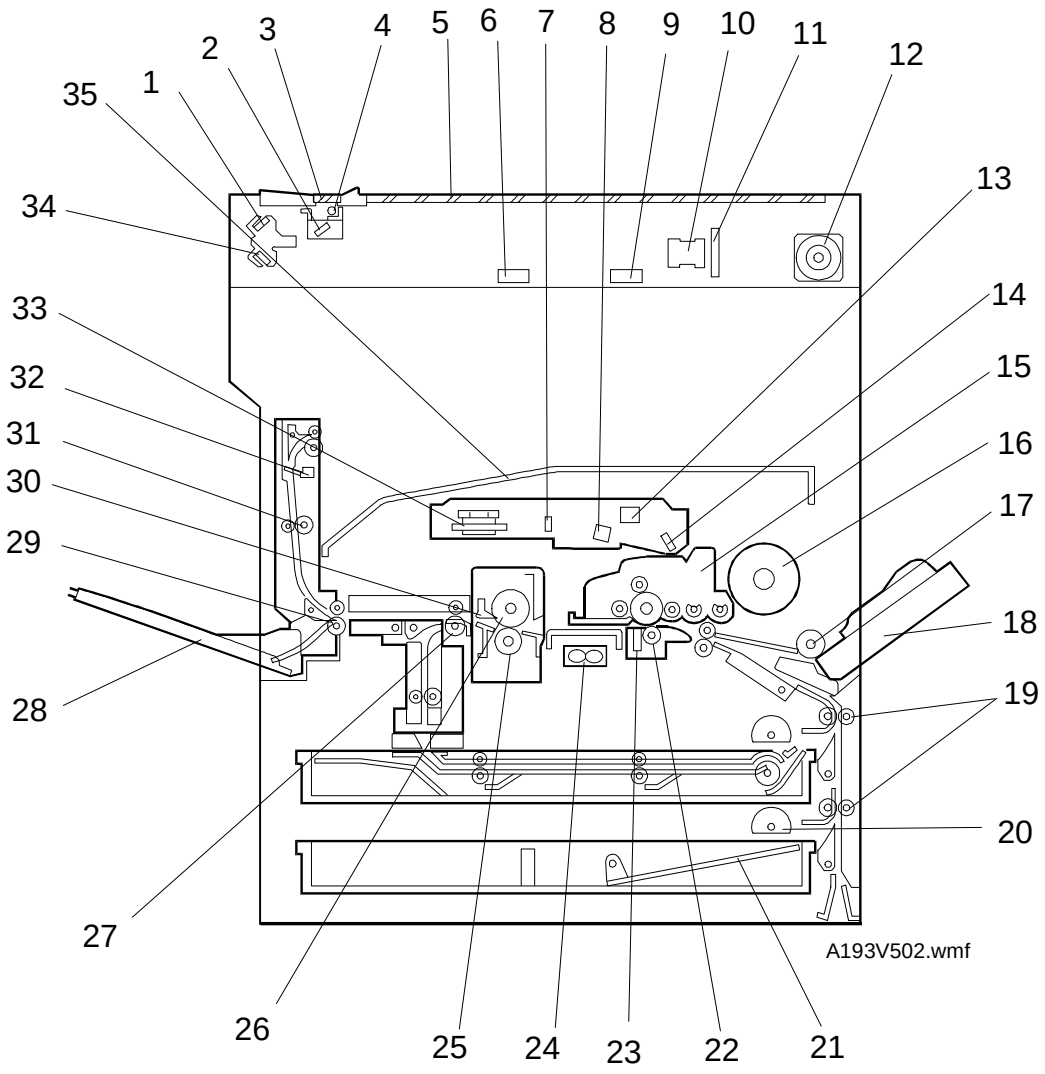
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Version	Item	Machine Code	No.
Copier	Copier	A193	E
	ADF (Option)	A628	D
	Paper Tray Unit (Option)	G697	F
	Duplex Unit (Option)	G694	C
	1-bin Sorter (Option)	A629	B
	Platen Cover (Option)	A645	
	Memory 4MB (Option)	A642-01	
	Memory 8MB (Option)	A642-02	
Fax	Fax Controller (Option)	A639-01 (115V), -02(230V), -03(France), -04 (TWN)	
	Telephone (Option)	H160	A
	ISDN (Option)	A644-01(115V), -02(230V)	
	HDD (Option)	A641	
	Memory Card (Option)	H130-54	
	Function Card (Option)	H130-52	
	Page Memory (Option)	A640	
Printer	Printer Controller (Option)	A643-00 (115V), -01(230V)	
	PS Option (Option)	A643-02	
	HDD (Option)	A643-03	

3. PAPER PATH


Optional
1-bin
Sorter
Face
Down Tray
Face Up
Tray
Optional
Duplex
Tray
Paper
Tray
Optional
Paper
Tray Unit
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4. MECHANICAL COMPONENT LAYOUT



1. 2nd Mirror
2. 1st Mirror
3. DF Exposure Glass
4. Xenon Lamp
5. Exposure Glass
6. Original Width Sensors
7. 1st Mirror
8. Barrel Toroidal Lens (BTL)
9. Original Length Sensors
10. Lens
11. SBU Board
12. Scanner Motor
13. F-theta Mirror
14. 2nd Mirror (Laser Unit)
15. PCU
16. Toner Bottle
17. By-pass Feed Roller
18. By-pass Table
19. Relay Rollers
20. Paper Feed Rollers
21. Bottom Plate
22. Transfer Roller
23. Separation Brush
24. Transport Vacuum Fan
25. Pressure Roller
26. Hot Roller
27. Fusing Exit Roller
28. Left Vertical Door/Face Up Tray
29. Junction Gate
30. Hot Roller Strippers
31. Left Vertical Roller
32. Lower Exit Sensor
33. Polygonal Mirror Motor
34. 3rd Mirror
35. Face Down Tray

5. ELECTRICAL COMPONENT DESCRIPTIONS

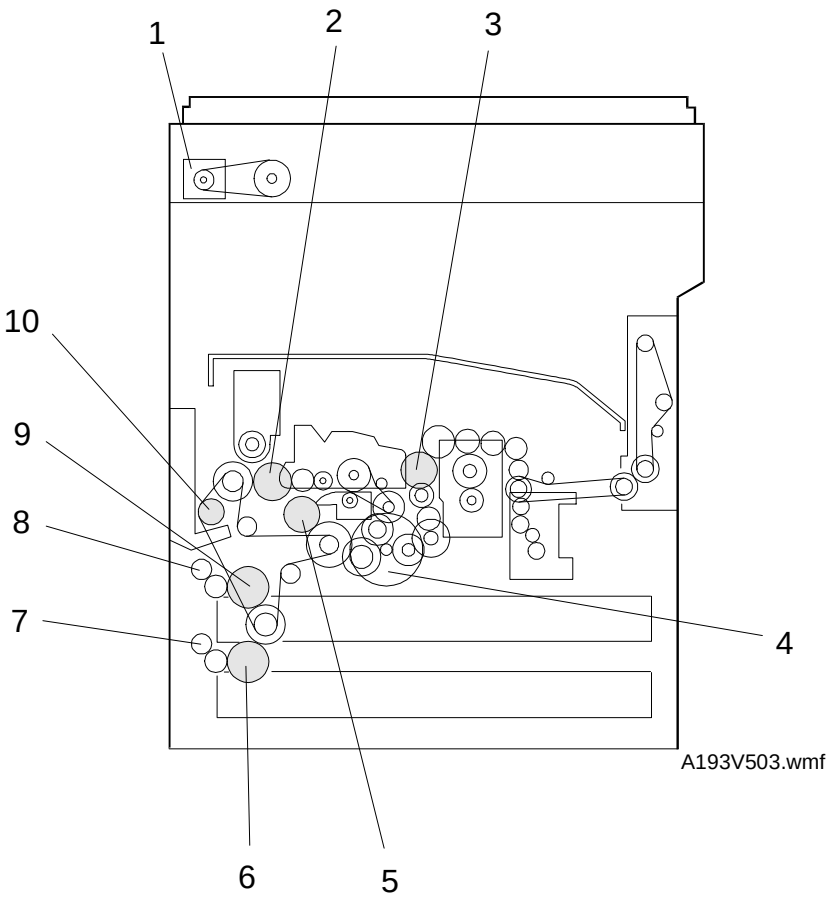
Refer to the electrical component layout and the point-to-point diagram on the waterproof paper in the pocket for the locations of these components.

Symbol	Index No.	Description	Note
Printed Circuit Boards			
PCB1	54	High Voltage Supply Board	Supplies high voltage to the drum charge roller, development roller, transfer roller, and discharge brush.
PCB2	50	Lamp Stabilizer	Provides dc power for the exposure lamp.
PCB3	58	PSU	Provides dc power to the system and ac power to the fusing lamp.
PCB4	61	LD Unit	Controls the laser diode.
PCB5	62	Operation Panel	Controls the touch panel display and LED matrix, and monitors the key matrix.
PCB6	51	SBU	Contains the CCD, and outputs a video signal to the BICU board.
PCB7	55	IOCSS	Controls the mechanical parts of the printer.
PCB8	52	BICU	Controls all copier functions both directly or through other control boards.
PCB9	53	MSU	Compressed the image data, stores the data, and applies the image editing.
Motors			
M1	45	Main	Drives the main body components.
M2	36	Scanner Drive	Drives the 1st and 2nd scanners (dc stepper motor).
M3	47	Transport Vacuum Fan	Aids paper transportation from the transfer roller to the fusing unit.
M4	49	Polygonal Mirror	Turns the polygonal mirror.
M5	37	Toner Supply	Rotates the toner bottle to supply toner to the toner supply unit.
M6	35	Exhaust Fan	Removes heat from around the fusing unit.
Sensors			
S1	33	Upper Exit	Detects misfeeds.
S2	31	Lower Exit	Detects misfeeds.
S3	28	Left Vertical Door	Cuts the +5 and +24 Vdc power lines.
S4	27	Left Door	Detects whether the left door is open or closed.
S5	17	Relay	Detects the leading edge of paper from the paper tray and duplex unit to determine the stop timing of the paper feed clutch and duplex feed motor. Also detects misfeeds.
S6	10	PCU	Detects when a new PCU is installed.
S7	29	Fusing Exit	Detects misfeeds.

Symbol	Index No.	Description	Note
S8	9	Charge Roller H.P	Informs the CPU when the drum charge roller is at home position.
S9	14	Upper Tray Paper End	Informs the CPU when the upper paper tray runs out of paper.
S10	15	Lower Tray Paper End	Informs the CPU when the lower paper tray runs out of paper.
S11	16	By-pass Feed Paper End	Informs the CPU when there is no paper in the by-pass tray.
S12	12	Registration	Detects the leading edge of the copy paper to determine the stop timing of the paper feed clutch, and detects misfeeds.
S13	11	By-pass Feed Paper Width	Detects the width of the paper in the by-pass feed table.
S14	59	Humidity	Monitors the humidity around the PCU.
S15	4	Original Width	Detects the width of the original. This is one of the APS (Auto Paper Select) sensors.
S16	5	Original Length-1	Detects the length of the original. This is one of the APS (Auto Paper Select) sensors.
S17	6	Original Length-2	Detects the length of the original. This is one of the APS (Auto Paper Select) sensors.
S18	3	Platen Cover	Informs the CPU whether the platen cover is up or down (related to APS/ARE functions). ARE: Auto Reduce and Enlarge
S19	1	Scanner H.P.	Informs the CPU when the 1st and 2nd scanners are at the home position.
S20	23	Toner Density (TD)	Detects the amount of toner inside the development unit.
Switches			
SW1	21	AC	Supplies power to the copier.
SW2	32	Main	Supplies power to operate the machine.
SW3	13	Right Vertical Guide	Cuts the +5 and +24 Vdc power lines.
SW4	20	Upper Paper Size	Determines what size of paper is in the upper paper tray.
SW5	19	Lower Paper Size	Determines what size of paper is in the lower paper tray.
SW6	26	Front Door Safety	Cuts the +5VLD and +24V dc power lines and detects whether the front cover is open or not.
Magnetic Clutches			
MC1	46	Charge Roller Contact	Controls the touch and release movement of the drum charge roller.
MC2	42	Upper Relay	Drives the upper relay rollers.
MC3	43	Lower Relay	Drives the lower relay rollers.
MC4	40	By-pass Feed	Starts paper feed from the by-pass feed table.
MC5	41	Upper Paper Feed	Starts paper feed from the upper paper tray.

Symbol	Index No.	Description	Note
MC6	44	Lower Paper Feed	Starts paper feed from the lower paper tray.
MC7	39	Registration	Drives the registration rollers.
MC8	38	Development	Drives the development roller.
Solenoids			
SOL1	48	Junction Gate	Moves the junction gate to direct copies to the face up or face down copy tray.
Lamps			
L1	60	Quenching	Neutralizes any charge remaining on the drum surface after cleaning.
L2	2	Scanner	Applies light to the original for exposure.
L3	8	Fusing	Provides heat to the hot roller.
Heaters			
H1	18	Tray (option)	Turns on when the main switch is off to keep paper in the paper tray dry. Tray heaters are also available for the optional paper feed unit.
H2	34	Anti-condensation (option)	Turns on when the main switch is off to prevent moisture from accumulating.
Thermistors			
TH1	24	Charge Roller	Monitors the temperature of the drum charge roller.
TH2	22	Fusing	Monitors the temperature of the hot roller.
Thermofuses			
TF1	7	Fusing	Provides back-up overheat protection in the fusing unit.
Counters			
CO1	25	Total	Keeps track of the total number of copies made.
CO2	---	Key (option)	Used for control of authorized use. The copier will not operate until it is installed.
Others			
LSD1	30	Laser Synchronization Detector	Detects the laser beam at the start of the main scan.
NF	56	Noise Filter (230V machine only)	Removes electrical noise from the AC input line.
CB	57	Circuit Breaker (230V machine only)	Guards against voltage surges in the AC input line.

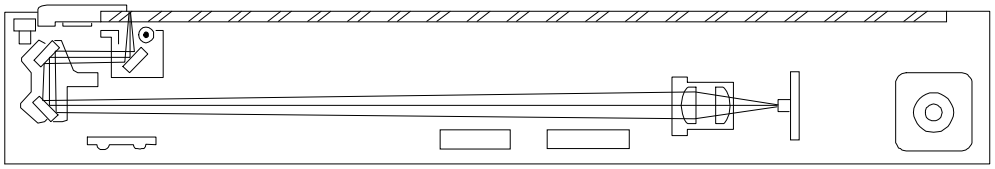
6. DRIVE LAYOUT



1. Scanner Drive Motor
2. Development Clutch
3. Charge Roller Contact
4. Main Motor
5. Registration Clutch
6. Lower Paper Feed Clutch
7. Lower Relay Clutch
8. Upper Relay Clutch
9. Upper Paper Feed Clutch
10. By-pass Feed Clutch

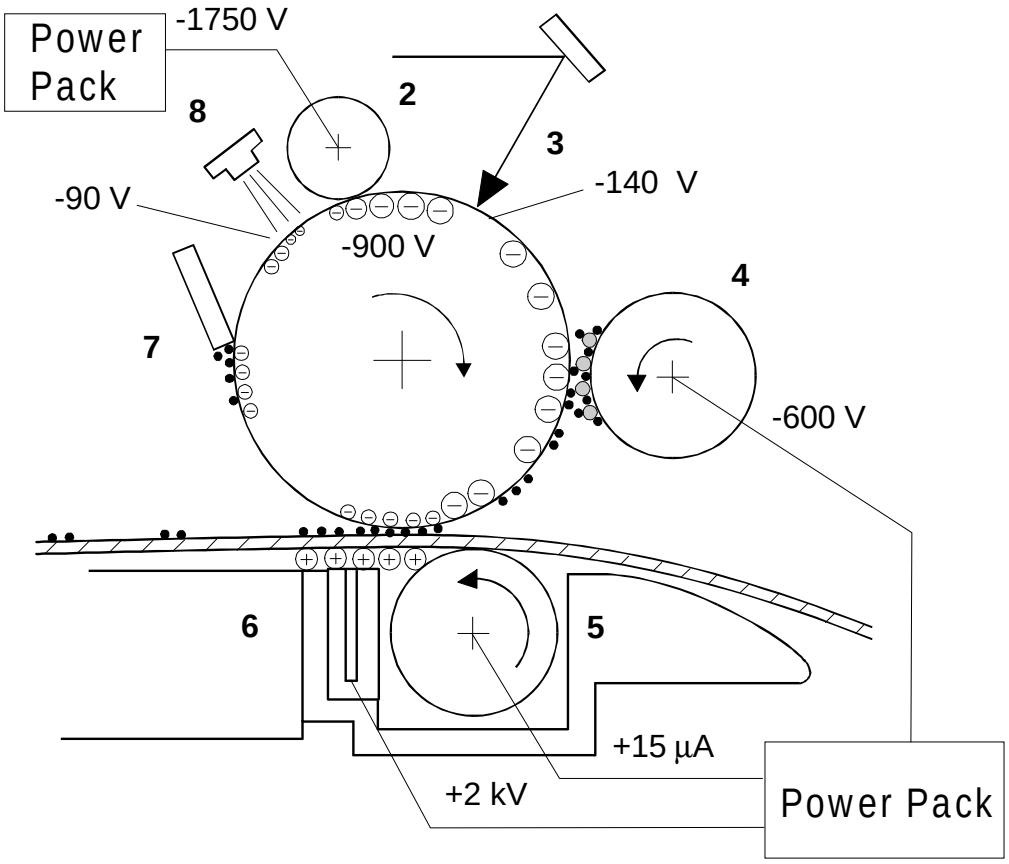
7. COPY PROCESS

7.1 OVERVIEW



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1. EXPOSURE
A xenon lamp exposes the original. Light reflected from the original passes to the CCD, where it is converted into an analog data signal. This data is converted to a digital signal, processed, and stored in the memory. At the time of printing, the data is retrieved and sent to the laser diode. For multi-copy runs, the original is scanned once only and stored to the memory.

2. DRUM CHARGE
In the dark, the charge roller gives a negative charge to the organic photo-conductive (OPC) drum. The charge remains on the surface of the drum because the OPC layer has a high electrical resistance in the dark.

3. LASER EXPOSURE
The processed data scanned from the original is retrieved from the memory and transferred to the drum by a laser beam, which forms an electrical latent image on the drum surface. The amount of charge remaining as a latent image on the drum depends on the laser beam intensity, which is controlled by the BICU board.

4. DEVELOPMENT
The magnetic developer brush on the development rollers comes in contact with the latent image on the drum surface. Toner particles are electrostatically attracted to the areas of the drum surface where the laser reduced the negative charge on the drum.

5. IMAGE TRANSFER
Paper is fed to the area between the drum surface and the transfer roller at the proper time for aligning the copy paper and the developed image on the drum surface. Then, the transfer roller applies a high positive charge to the reverse side of paper. This positive charge produces an electrical force which pulls the toner particles from the drum surface on to the paper. At the same time, the paper is electrically attracted to the transfer roller.

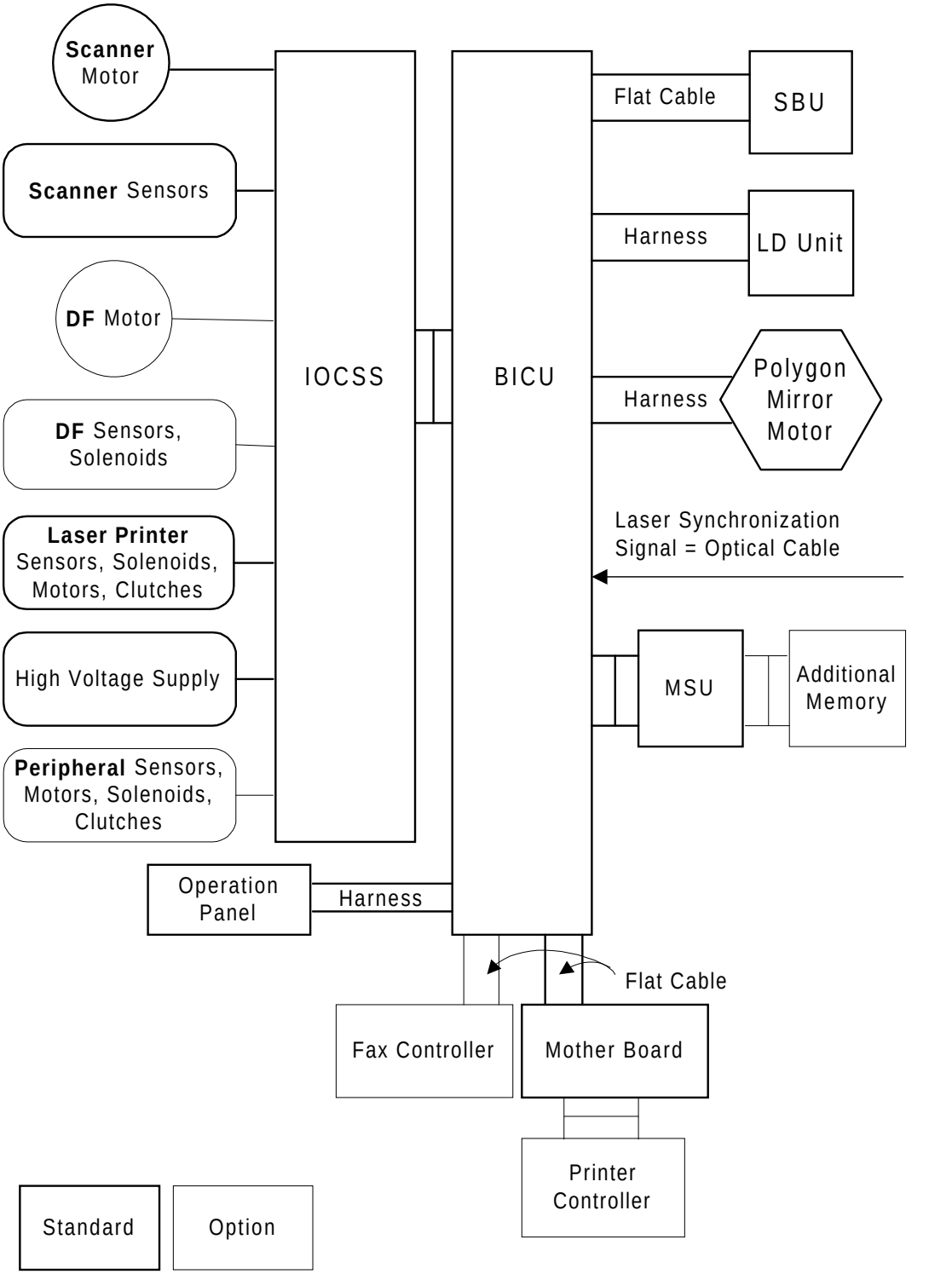
6. PAPER SEPARATION
Paper separates from the drum as a result of the electrical attraction between the paper and the transfer roller. The discharge brush helps separate the paper from the drum.

7. CLEANING
The cleaning blade removes any toner remaining on the drum surface after the image is transferred to the paper.

8. QUENCHING
The light from the quenching lamp electrically neutralizes the charge on the drum surface.

8. BOARD STRUCTURE

8.1 OVERVIEW



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8.2 DESCRIPTION

1. BICU (Base Engine and Image Control Unit)

This is the main board. It controls the following functions:

- Engine sequence
- Scanner, laser printer engine
- Timing control for peripherals
- Image processing, video control
- Operation control
- Corresponding application boards
- Machine control, system control

2. IOCSS (I/O and Customer Support System Unit)

The IOCSS board handles the following functions:

- Drive control for the sensors, motors, solenoids of the printer and scanner
- PWM control for the high voltage control board
- Serial interfaces with peripherals
- Circuit for fusing control

3. SBU (Sensor Board Unit)

The SBU deals with the analog signals from the CCD and converts them into digital signals.

4. MSU (Memory Super-charger Unit)

The MSU stores and compresses the image data. It also does image editing on the data if requested by the user. An extra 4 MB or 8 MB of memory can be added (see below).

5. Additional Memory (Option)

This is an additional image memory board for the MSU.

6. LD Unit

This is the laser diode drive circuit board.

7. Mother Board

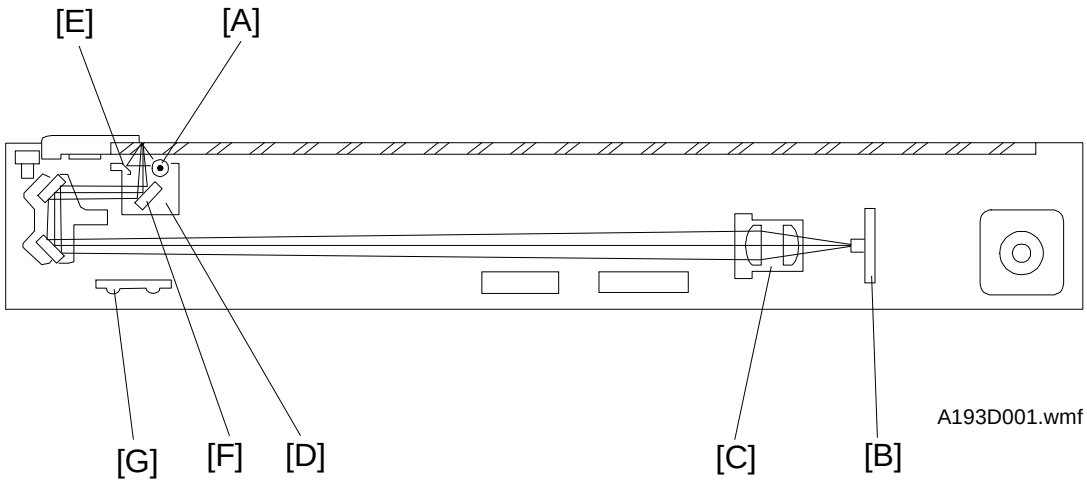
This is the printer control board as well as the BICU interface board. It receives the signals from the printer control board and sends signals to the printer control board.

SECTION 2

DETAILED SECTION DESCRIPTIONS

1. SCANNING

1.1 OVERVIEW



The original is illuminated by the exposure lamp (a xenon lamp in this model) [A]. The image is reflected onto a CCD (charge coupled device) [B] via the 1st, 2nd, 3rd mirrors, and lens [C].

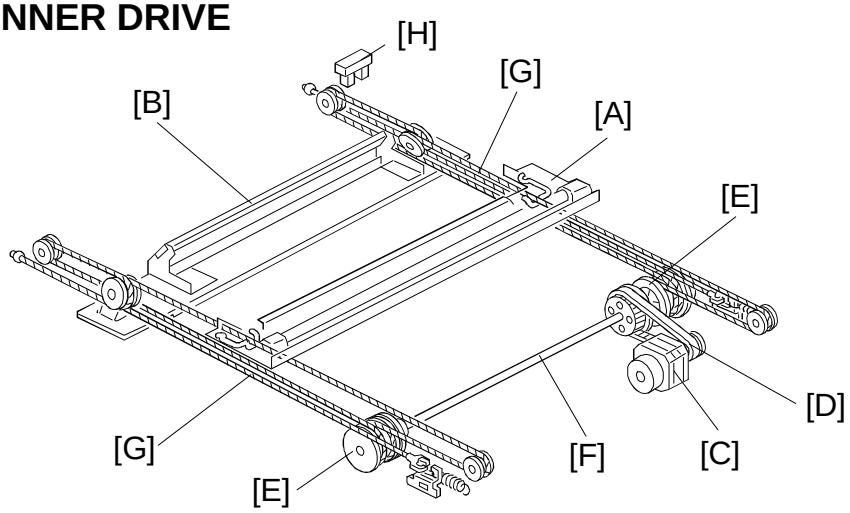
The 1st scanner [D] consists of the exposure lamp, a reflector [E], and the 1st mirror [F].

The exposure lamp is energized by a dc supply to avoid uneven light intensity as the 1st scanner moves in the sub scan direction. The entire exposure lamp surface is frosted to ensure even exposure in the main scan direction.

The light reflected by the reflector is of almost equal intensity, to reduce shadows on pasted originals.

An optics anti-condensation heater [G] is available as an option. It can be installed on the left side of the inner cover. It turns on whenever the power cord is plugged in.

1.2 SCANNER DRIVE



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A stepper motor is used to drive the scanner. The 1st and 2nd scanners [A,B] are driven by this scanner drive motor [C] through the timing belt [D], scanner drive pulley [E], scanner drive shaft [F], and two scanner wires [G].

– Book mode –

The scanner drive board controls and operates the scanner drive motor. In full size mode, the 1st scanner speed is 90 mm/s during scanning. The 2nd scanner speed is half that of the 1st scanner.

In reduction or enlargement mode, the scanning speed depends on the magnification ratio (M: 0.25 to 4.00). The returning speed is always the same, whether in full size or magnification mode. The image length change in the sub scan direction is done by changing the scanner drive motor speed, and in the main scan direction it is done by image processing on the BICU board.

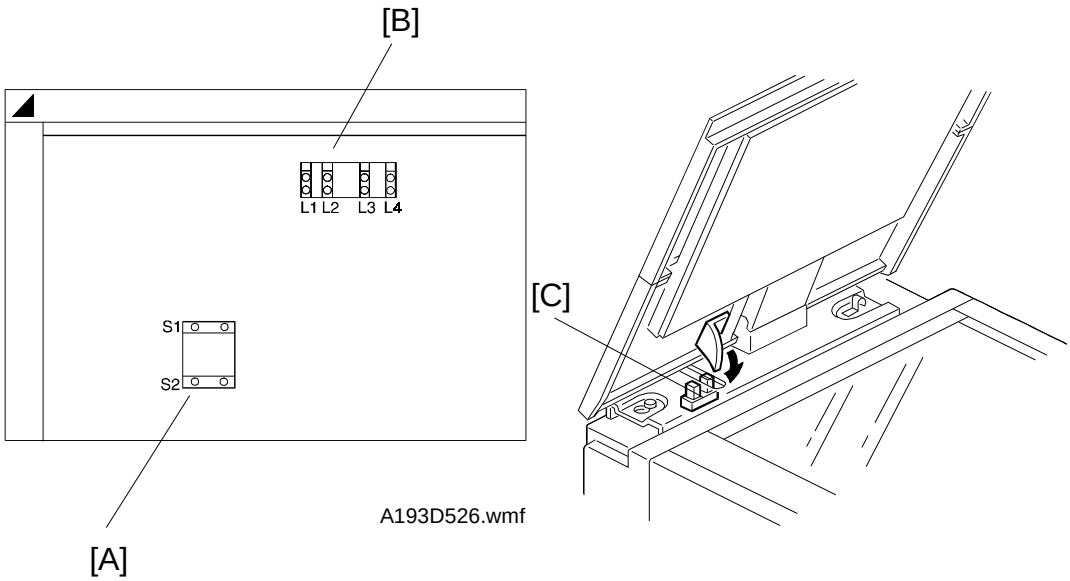
Magnification in the sub-scan direction can be adjusted by changing the scanner drive motor speed using SP4-101. Magnification in the main scan direction can be adjusted using SP4-008.

– ADF mode –

The scanners are always kept at their home position (the scanner H.P sensor [H] detects the 1st scanner) to scan the original. The ADF motor feeds the original through the ADF. In reduction/enlargement mode, the image length change in the sub-scan direction is done by changing the ADF motor speed. Magnification in the main scan direction is done in the BICU board, like for book mode.

Magnification in the sub-scan direction can be adjusted by changing the ADF motor speed using SP6-007. In the main scan direction, it can be adjusted with SP4-008, like for book mode.

1.3 ORIGINAL SIZE DETECTION IN PLATEN MODE



In the optics cavity for original size detection, there are four reflective sensors in the 115V machines, and six reflective sensors in the 230V machines. The Original Width Sensors [A] detect the original width, and the Original Length Sensors [B] detect the original length. These are the APS (Auto Paper Select) sensors. Each APS sensor is a reflective photosensor.

While the main switch is on, these sensors are active and the original size data is always sent to the CPU. However, the CPU checks the data only when the platen cover is opened.

The original size data is taken by the main CPU when the platen cover sensor [C] is activated. This is when the platen is positioned about 15 cm above the exposure glass. At this time, only the sensor(s) located underneath the original receive the reflected light and switch on. The other sensor(s) are off. The main CPU can recognize the original size from the on/off signals from the APS sensors.

If the copy is made with the platen fully open, the main CPU decides the original size from the sensor outputs when the Start key is pressed.

Original Size		Length Sensors				Width Sensors	
A4/A3 version	**LT/DLT version**	L1	L2	L3	L4	S1	S2
A3	11" x 17"	O	O	O	O	O	O
B4	10" x 14"	O	O	O	O	O	X
F4	8 1/2" x 14" (8" x 13")	O	O	O	X	X	X
A4–L	8 1/2" x 11"	O	O	X	X	X	X
B5–L	—	O	X	X	X	X	X
A4–S	11" x 8 1/2"	X	X	X	X	O	O
B5–S	—	X	X	X	X	O	X

O: ON X: OFF

NOTE: The length sensors L3 and L4 are used only for 230V machines.

For other combinations, "CANNOT DETECT ORIG. SIZE" will be indicated on the operation panel display.

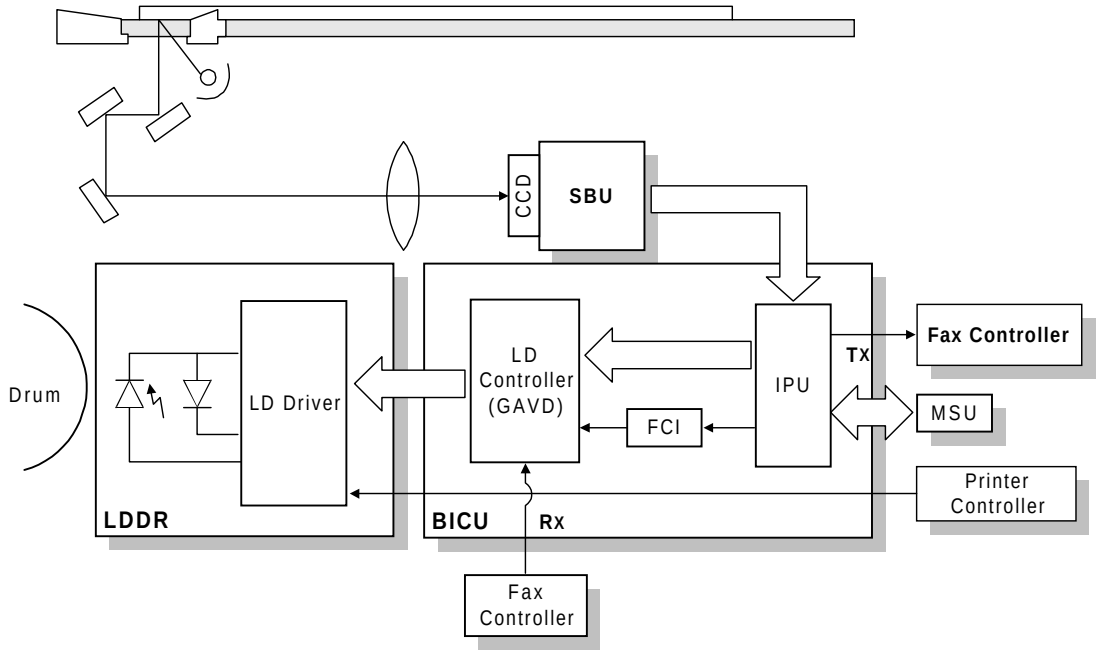
The above table shows the outputs of the sensors for each original size. This original size detection method eliminates the necessity for a pre-scan and increases the machine's productivity.

However, if the by-pass feeder is used, note that the machine assumes that the copy paper is lengthwise. For example, if A4 sideways paper is placed on the by-pass tray, the machine assumes it is A3 paper and scans the full A3 area, disregarding the original size sensors. This can cause excess toner to be transferred to the transfer roller, so users should be instructed to always set the paper lengthwise on the by-pass tray. This problem occurs for the first page only. The registration sensor detects the length of the first page, and will assume that the following sheets of copy paper are the same length.

Original size detection using the ADF is described in the manual for the ADF.

2. IMAGE PROCESSING

2.1 OVERVIEW



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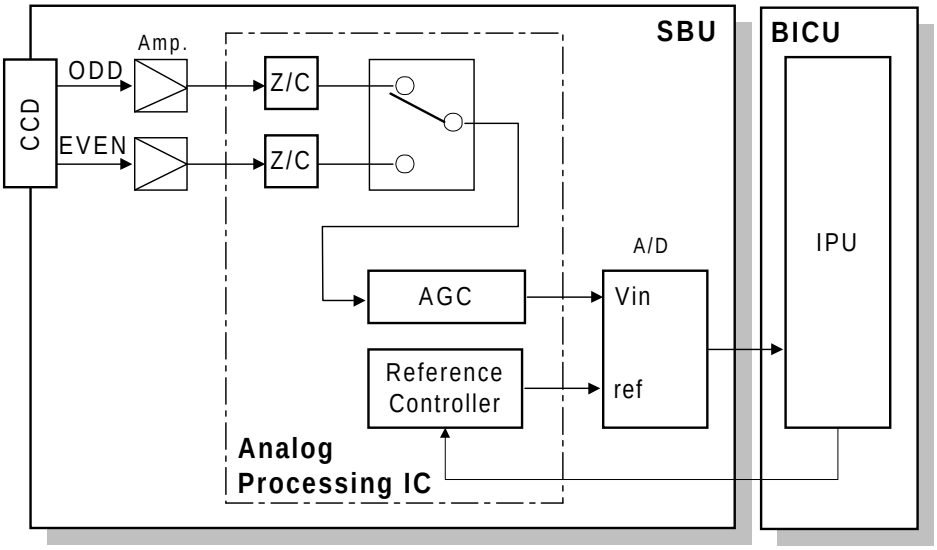
The CCD generates an analog video signal. The SBU (Sensor Board Unit) converts the analog signal to an 8-bit digital signal, then it sends the digital signal to the BICU (Base-engine and Image Control Unit) board.

The BICU board can be divided into three image processing blocks; the IPU (Image Processing Unit), FCI (Fine Character Image), and LD controller (GAVD)

- IPU: Auto shading, filtering, magnification, γ correction, and gradation processing
- FCI: Smoothing (binary picture processing mode only)
- LD controller: LD print timing control and laser power PWM control

Finally, the BICU board sends the video data to the LD drive board at the correct time.

2.2 SBU (SENSOR BOARD UNIT)



Z/C: Zero Clamp
AGC: Automatic Gain Control Circuit

A193D502.wmf

The CCD converts the light reflected from the original into an analog signal. The CCD line has 5,000 pixels and the resolution is 400 dpi (15.7 lines/mm).

The CCD has two output lines, for odd and even pixels, to the analog processing IC. The analog processing IC performs the following operations on the signals from the CCD:

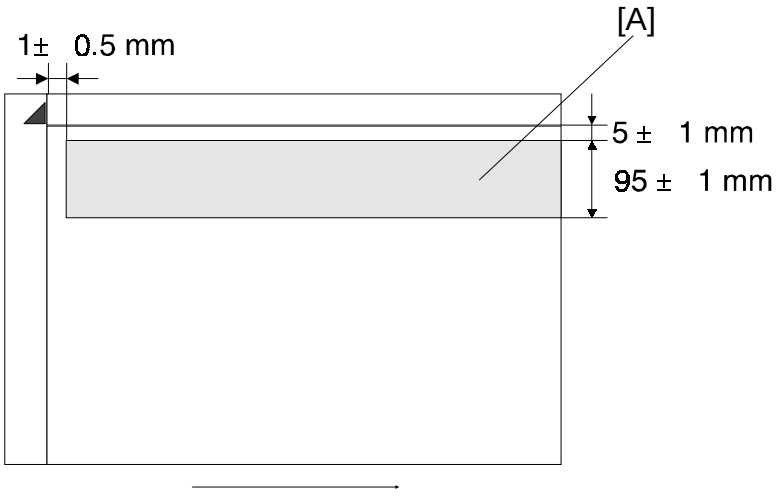
1) Z/C (Zero Clamp):
   Adjusts the black level reference for even pixels to match the odd pixels.

2) Signal Composition:
   Analog signals for odd and even pixels from the CCD are merged by a switching device.

3) Signal Amplification
   The analog signal is amplified by operational amplifiers in the AGC circuit. The maximum gains of the operational amplifiers are controlled by the CPU on the BICU board.

After the above processing, the analog signals are converted to 8-bit signals by the A/D converter. This will give a value for each pixel on a scale of 256 grades. Then, the digitized image data goes to the BICU board.

2.3 AUTO IMAGE DENSITY (ADS)



A193D004.wmf

This mode prevents the background of an original from appearing on copies.

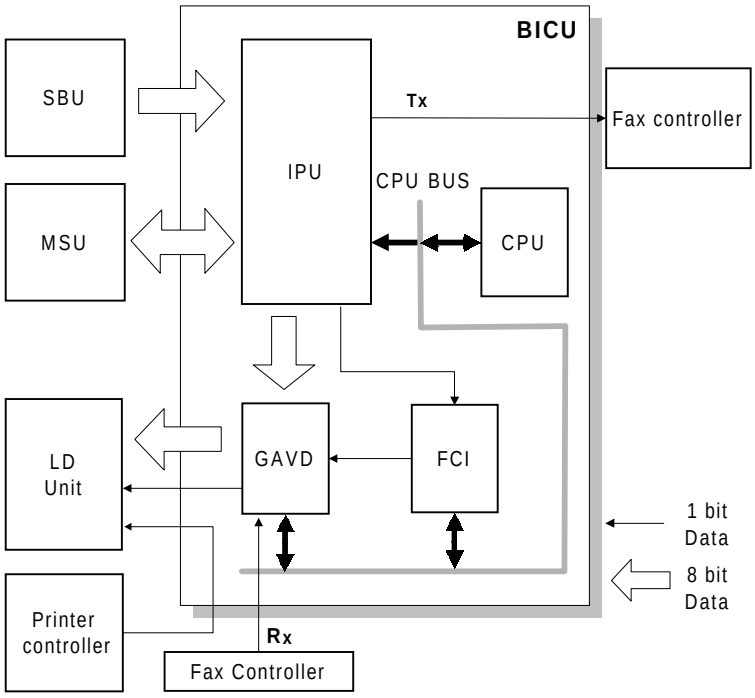
The copier scans the auto image density detection area [A] as shown in the diagram. This corresponds to a few mm at one end of the main scan line. As the scanner scans down the page, the IPU on the BICU detects the peak white level for each scan line. The IPU determines the reference value for the A/D conversion for a particular scan line using the peak white level for that scan line. Then, the IPU sends the reference value data to the reference controller on the SBU.

When an original with a gray background is scanned, the density of the gray area is the peak white level density. Therefore, the original background will not appear on copies. Because peak level data is taken for each scan line, ADS corrects for any changes in background density down the page.

As with previous digital copiers, the user can select manual image density when selecting auto image density mode, and the machine will use both settings when processing the original.

2.4 IPU (IMAGE PROCESSING UNIT)

2.4.1 Overview



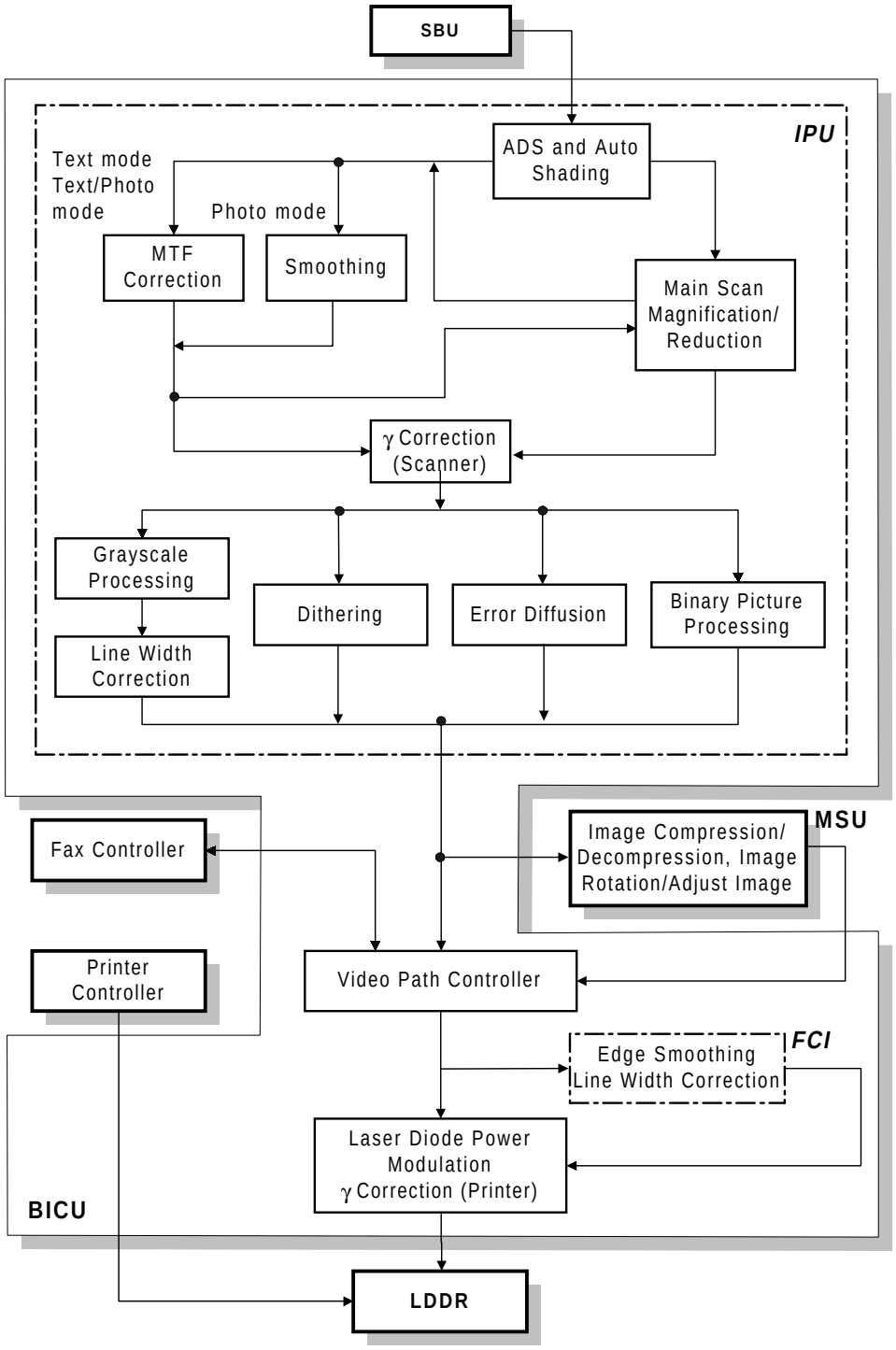
A193D527.wmf

The image data from the SBU goes to the IPU (Image Processing Unit) IC on the BICU board, which carries out the following processes on the image data:

1. Auto shading
2. Filtering (MTF and smoothing)
3. Magnification
4. γ correction
5. Grayscale processing
6. Binary picture processing
7. Error diffusion
8. Dithering
9. Video path control
10. Test pattern generation

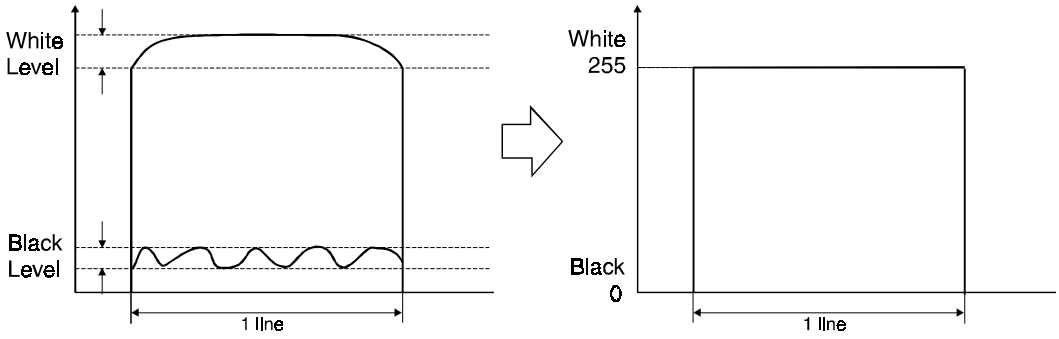
The image data then goes to either the LD controller (GAVD) or the FCI depending on the selected copy modes.

2.4.2 Image Processing Path



A193D506.wmf

2.4.3 Auto Shading



A193D517.wmf

As with the previous digital copiers, there are two auto shading methods. One is black level correction and the other is white level correction. Auto shading corrects errors in the signal level for each pixel.

1) Black Level Correction

The CPU reads the black dummy data from one end of the CCD signal (64 pixels at the end are blacked off) and takes the average of the black dummy data. Then, the CPU deletes the black level value from each image pixel.

2) White Level Correction

Before scanning the original, the machine reads a reference waveform from the white plate. The average of the white video level for each pixel is stored as the white shading data in the FIFO memory in the IPU chip.

The video signal information for each pixel obtained during image scanning is corrected by the IPU chip.

In book mode, auto shading is done at the beginning of each scan.
In ADF mode, auto shading is done at a specific time interval. This interval can be set with SP4-913 (the default setting is 30 seconds). The machine waits until the end of the page before doing the auto shading.

2.4.4 Filtering and Main Scan Magnification/Reduction

1. Overview

After auto shading, the image data is processed by both filtering and main scan magnification. However, to reduce the occurrence of moire in the image, the processing order is different depending on the reproduction ratio, as follows.

1) Reduction and Full size
   Main Scan Reduction → Filtering
2) Enlargement
   Filtering → Main Scan Magnification

2. Filtering

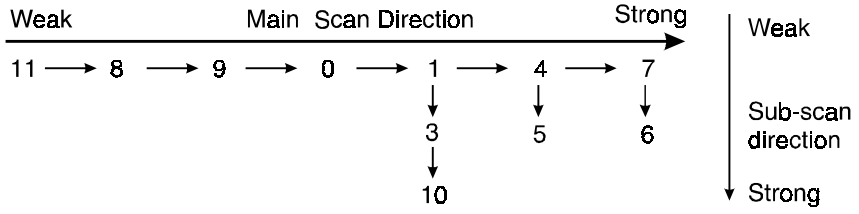
There are two software filters for enhancing the desired image qualities of the selected original mode: the MTF filter and the smoothing filter.

The MTF filter emphasizes sharpness and is used in Text and Text/Photo modes. The smoothing filter is used in Photo mode.

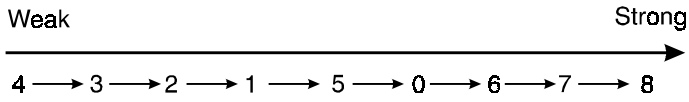
The relationships between the coefficient of the filter and the filter strengths are as follows. Note that these relationships are for copier mode only. Fax mode has its own unique table. (Refer to the fax section.)
The filter strengths for each mode can be adjusted with SP4-407.

NOTE: Never select "1." Abnormal images may result.

- MTF Filter -



- Smoothing Filter -

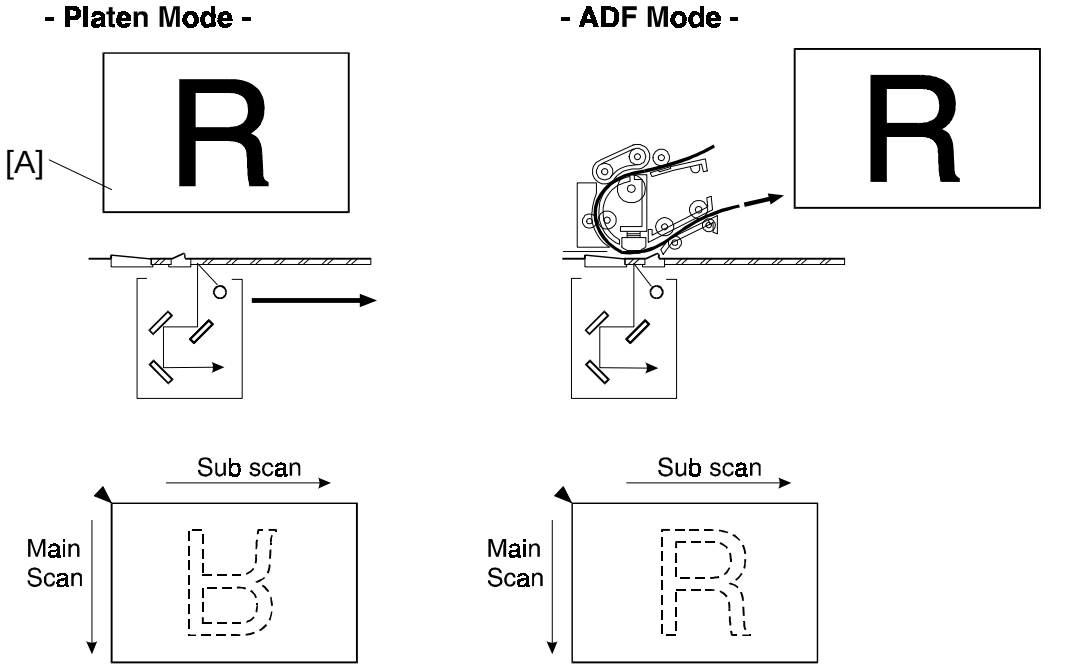


Note: The value is the filter number

A193D503.wmf

3. Main Scan Magnification/Reduction

Reduction and enlargement in the sub scan direction are done by changing the scanner speed. However, reduction and enlargement in the main scan direction are handled by the IPU chip. The processing for main scan magnification/reduction is the same as in the previous digital machines.



A193D504.wmf

When making a copy using the ADF, the magnification circuit creates a mirror image. This is because the scanning starting position in the main scan direction is at the other end of the scan line in ADF mode (as compared with platen mode). In platen mode, the original is placed face down on the exposure glass, and the corner at [A] is at the start of the main scan. The scanner moves down the page. In ADF mode, the ADF feeds the leading edge of the original to the DF exposure glass, and the opposite top corner of the original is at the main scan start position.

To create the mirror image, the CPU stores the main scan line data in the LIFO (Last In First Out) memory of the magnification block, from the last pixel. When loading the main scan line data from the LIFO memory, the CPU loads the first pixel of the main scan line.

2.4.5 Gamma (γ) Correction

Gamma correction ensures accurate generation of the various shades in the gray scale from black to white, accounting for the characteristics of the scanner and printer.

Scanner gamma correction corrects the data output to the IPU to account for the characteristics of the scanner (e.g., CCD response, scanner optics).

Printer gamma correction corrects the data output from the IPU to the laser diode to account for the characteristics of the printer (e.g., the characteristics of the drum, laser diode, and lenses).

The data for the scanner gamma correction is fixed and stored in the memory. The printer gamma correction can be adjusted with SP 2-916.

2.4.6 Gradation Processing

These are four types of gradation processing:

- Grayscale processing: This has 64 output levels for each pixel, and is used only in one-to-one copy mode.
- Binary picture processing: This has only two output levels (black and white), and is used in memory copying (e.g., multiple copy, rotate sort, and editing image) and facsimile transmission.
- Error diffusion: In Text/Photo mode, this is used with either grayscale processing or binary processing.
- Dithering: In Photo mode, this is used with either grayscale processing or binary processing.

These four processes are used as follows.

1) Grayscale processing mode

Text mode:	Grayscale processing
Text/Photo mode:	Grayscale processing + error diffusion
Photo mode:	Grayscale processing + dithering

2) Binary picture processing mode

Text mode:	Binary picture processing
Text/Photo mode:	Binary picture processing + error diffusion
Photo mode:	Binary picture processing + dithering

Copying using the memory (e.g., multiple copying) and fax mode always use binary picture processing. (Users requiring grayscale mode output for multiple copies will have to take a succession of one-to-one copies.)

For one-to-one copying, the processing mode used depends on the setting of SP 4-403. The factory setting is for grayscale processing.

1. Grayscale Processing

As stated on the previous page, this process generates up to 64 image density levels for each pixel. To realize this, this machine uses a form of pulse width modulation. In this machine, pulse width modulation consists of the following processes:

- Laser diode pulse positioning
- Laser diode power/pulse width modulation

Laser diode power and pulse width modulation is done by the laser diode drive board (LDDR), and will be explained in the Laser Exposure section. Briefly, the width of the laser pulse for a pixel depends on the output level (from 0 to 63) required for the pixel.

For each pixel, the location of the active (laser on) part of the pixel can be either at the left side of the pixel, at the center, or at the right side (see fig 2). The machine determines which method to use depending on the settings of SP 2-903. There are different settings for pixels at the left edge, at the right edge, and in the middle of a series of black/grey pixels across the main scan, and for single black pixels with white pixels at the left and right. The edges of characters and lines become clearer with this processing.

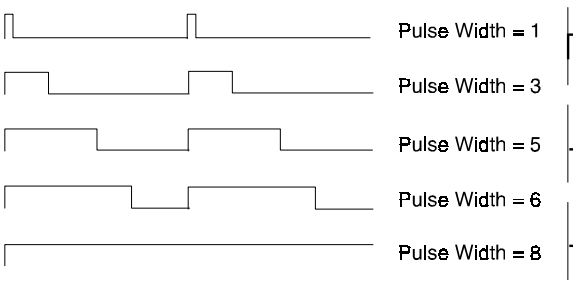


Fig. 1 A193D518.wmf

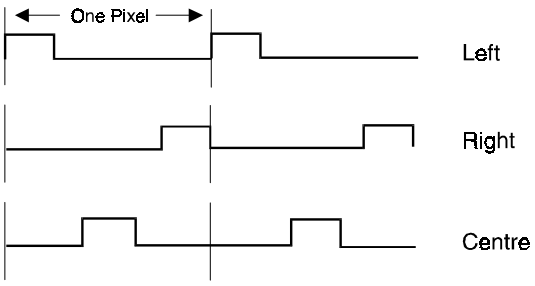


Fig. 2 A193D507.wmf

2. Binary Picture Processing

Each video signal level is converted from 8-bit to 1-bit (black and white image data) in accordance with a threshold value.

The threshold value can be adjusted with SP 4-418.

The printout density of the black pixel depends on the pixel type (left, center, or right of a series, or isolated, in the same way as for grayscale processing). These values can be adjusted with SP2-904.

3. Error Diffusion

This is used only in Text/Photo mode.

The error diffusion process reduces the difference in contrast between light and dark areas of a halftone image. Each pixel is corrected using the difference between it and the surrounding pixels. The corrected pixels are then compared with a error diffusion matrix. Separate error diffusion matrixes are used for copy mode and fax mode.

1) Grayscale processing mode

The output image signal level has 9 levels (from white to black).
There is only one matrix available.

2) Binary picture processing mode

The output image signal level has just 2 levels (white and black).
The threshold level can be changed with SP4-418-2.

4. Dithering

This is only used in Photo mode.

Each pixel is compared with a pixel in a dither matrix. Several matrixes are available, to increase or decrease the detail on the copy.

1) Grayscale processing mode
   The matrix type can be selected with SP4-421-1 and with UP mode.
2) Binary picture processing
   The matrix type can be selected with SP4-421-2 and with UP mode.

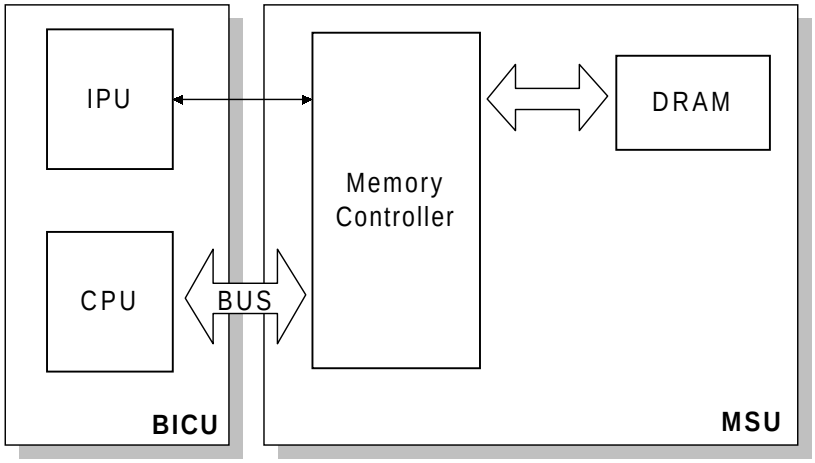
2.4.7 Line Width Correction

This function is effective only in Letter mode.

Usually, lines will bulge in the main scan direction as a result of the negative/positive development system that is used in this model. So, pixels on edges between black and white areas are compared with adjacent pixels, and if the pixel is on a line, the line thickness will be reduced.

The line width correction in grayscale processing mode is done in the IPU, and in binary processing mode, it is done in the FCI chip.

2.5 MSU (MEMORY SUPER-CHARGER UNIT)



A193D528.wmf

The MSU consists of the memory controller and the DRAM. The functions of each device are as follows.

Memory Controller: Compressing the 1-bit image data
Image rotation
Image data transfer to the DRAM

DRAM (standard 4MB): Stores the compressed data (2 MB)
Working area (2 MB)

The data which was treated with binary picture processing goes to the MSU. The data is first compressed using the MMR process and the compressed data is stored in the DRAM. When printing, the data from the DRAM goes back to the memory controller, where the data is decompressed and image editing is done (e.g., image rotation, repeat image, combine image).

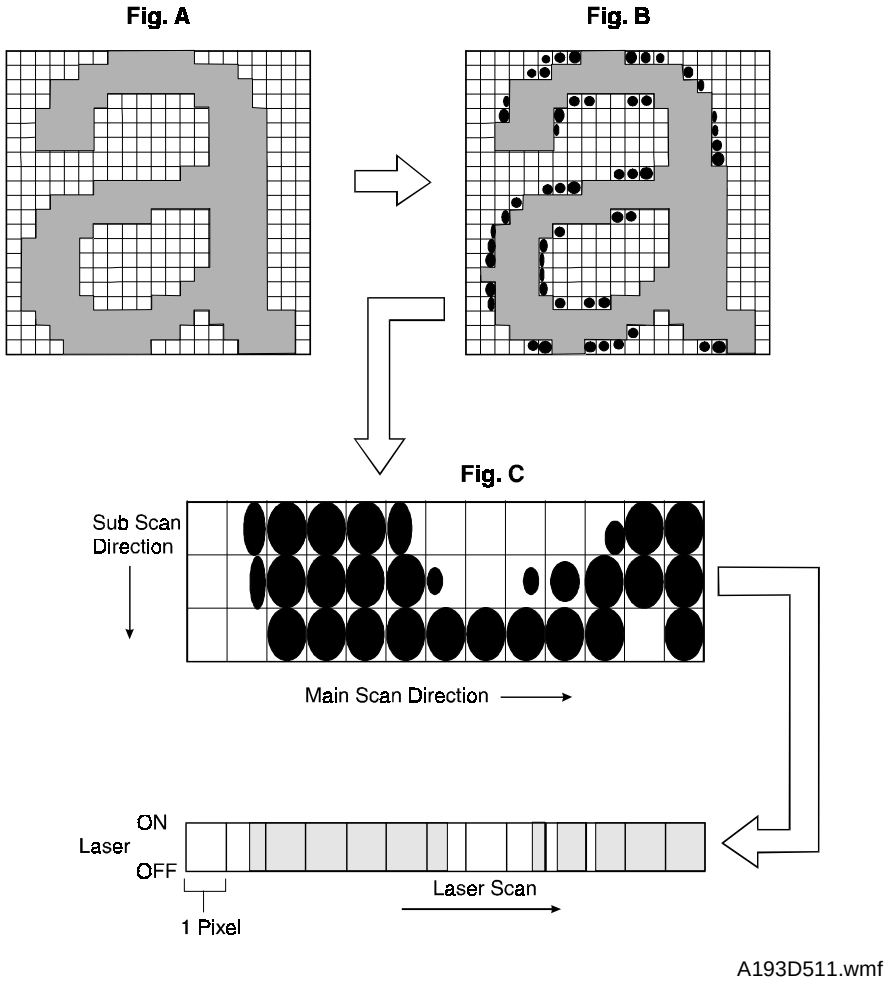
The memory capacity changes when optional memory is installed on the MSU board. The copier functions for each memory combination are as follows.

		Standard (4 MB)	Optional 4 MB	Optional 8 MB
Multi duplex copy		X	O	O
Sort, Rotate Sort	A4, LT	O	O	O
	B4, LG	X	O	O
	A3, DLT	X	O	O
Number of pages	A4 6%	35	99	99
	ITU-T#4 (12% black)	15	45	75

X: Not Available O: Available

2.6 FCI (FINE CHARACTER AND IMAGE)

The FCI performs image smoothing and line width correction. These functions only affect binary picture processed images in Letter mode. The fax board and the printer controller each have independent smoothing circuits.



Usually, binary picture processing generates jagged edges on characters as shown in the above left illustration. The FCI reduces jagged edges of characters using the image smoothing process.

Whether or not the object pixel undergoes smoothing depends on the surrounding image data. The smoothing process for the object pixel is done by changing the laser pulse positioning and the laser power.

FCI smoothing can be switched on or off with SP 2-902.

3. LASER EXPOSURE

3.1 OVERVIEW

This machine uses a laser diode to produce electrostatic images on an OPC drum. The laser diode unit converts image data from the BICU board into laser pulses, and the optical components direct these pulses to the drum.

To produce a high quality copy image, these are 64 gradations for the laser pulses, controlled through power modulation and pulse width modulation.

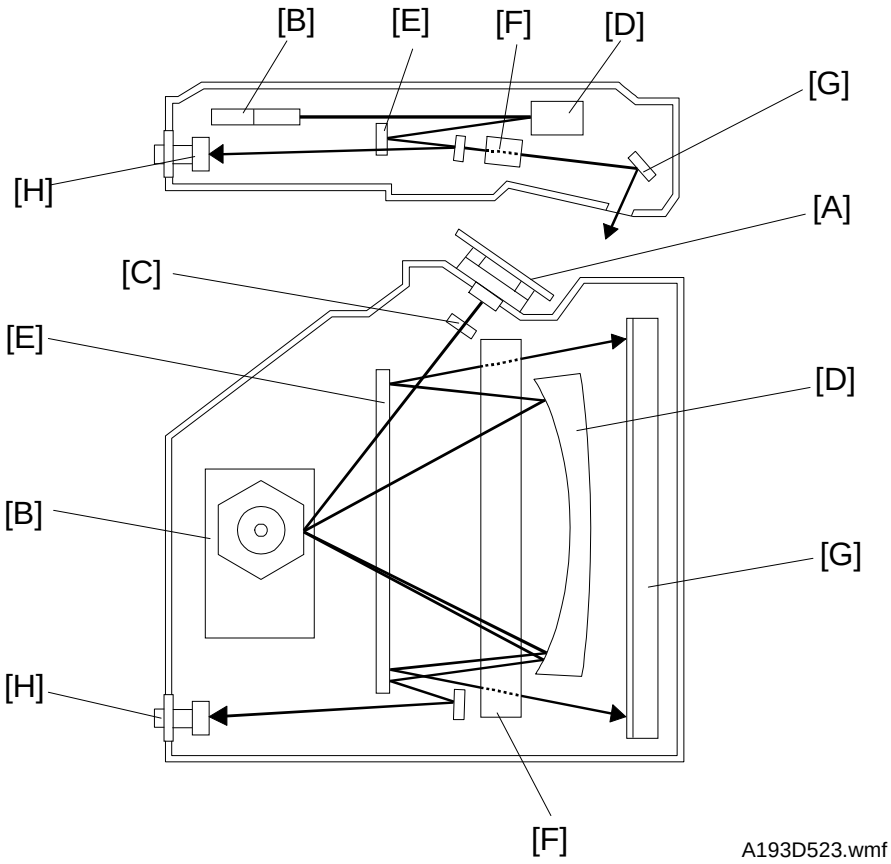
Exposure of the drum by the laser beam creates the latent image. The laser beam makes the main scan while drum rotation controls the sub scan.

The strength of the beam is 0.6 mW on the drum surface at a wavelength of 780 nm.

There are four polygon motor speeds:

Resolution (dpi)	Modes	Motor Speed (rpm)	Data Frequency (MHz)
400 dpi	Copy, Fax, and Printer	14173.23	9.276
600 dpi	Printer	21259.84	20.872
391.16 dpi	Fax (Image rotation)	13860.00	9.216
406.4 dpi	Fax (mm printing)	14400.00	9.216

3.2 OPTICAL PATH



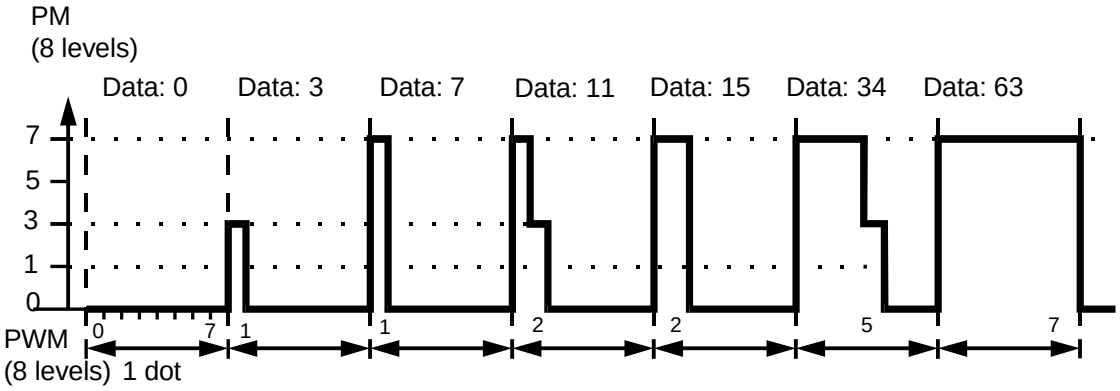
The output path from the laser diode to the drum is shown above.

The LD unit [A] outputs the laser beam to the polygon mirror [B] through the cylindrical lens [C].

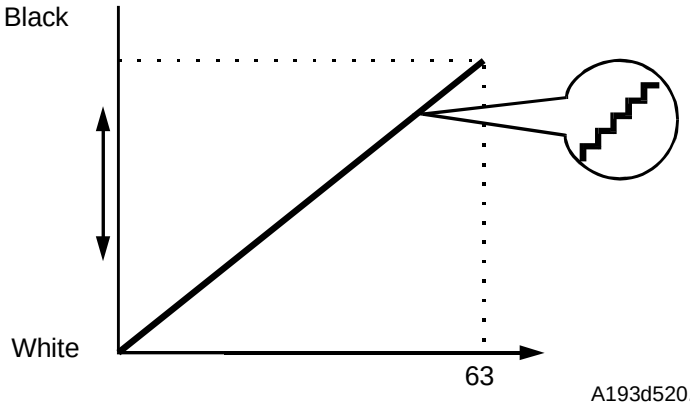
Each surface of the polygon mirror reflects a full main scan line. The laser beam goes to the F-theta mirror [D], 1st mirror [E], and BTL [F]. The 2nd mirror [G] reflects the laser beam to the drum through the toner shield glass.

The laser synchronizing detector [H] determines the main scan starting position.

3.3 GRADATION CONTROL (LASER POWER MODULATION)



A193D519.wmf



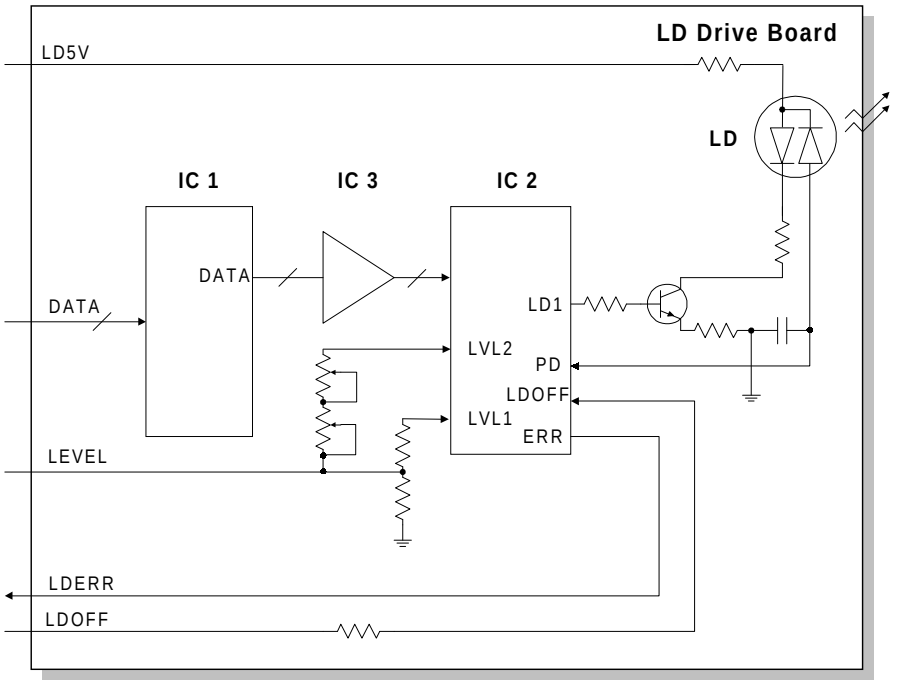
A193d520.wmf

To make the latent image, the laser beam illuminates the image area of the drum surface. The longer the laser is on and the stronger its intensity is, the darker the developed pixel becomes. Modulating (changing) the width of the pulse makes the on time of the laser longer or shorter (PWM). There are eight pulse width levels in this model.

While the laser is on to make one dot, the intensity of the laser is controlled by power modulation (PM). The laser's intensity is controlled by the amount of current sent to the laser diode. Modulating the power makes the laser brighter or dimmer. There 8 power levels, or laser intensity levels. The power is modulated only on the final part of the laser pulse (example: see data 11 in the diagram).

The machine uses the 8 pulse width levels and 8 power levels to create the 64 possible grayscale values for each pixel.

3.4 AUTO POWER CONTROL (APC)



A193D521.wmf

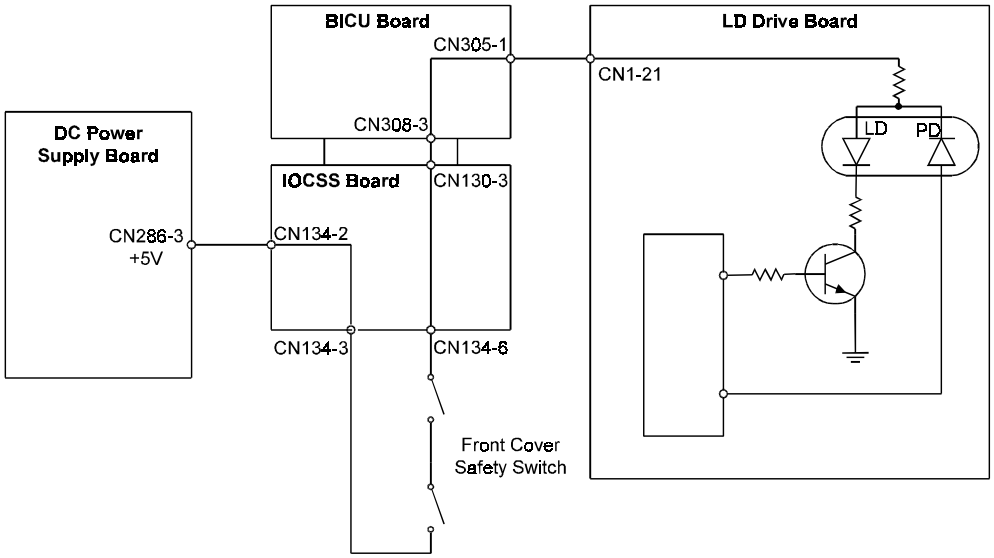
Even if a constant electric current is applied to the laser diode, the intensity of the output light changes with the temperature. The intensity of the output decreases as the temperature increases.

In order to keep the output level constant, the output light intensity is monitored through a photodiode (PD) enclosed in the laser diode. The photodiode passes an electrical current that is proportional to the light intensity. The output is not affected by temperature, so it faithfully reflects the changes in the LD output, without adding anything itself.

Just after the machine is turned on, IC2 on the laser drive board excites the laser diode at full power and the output of the photodiode is stored as a reference in IC2. IC2 monitors the current passing through the photodiode (PD). Then it increases or decreases the current to the laser diode as necessary, comparing it with the reference level (LVL2). Such auto power control is done during printing while the laser diode is active.

The laser diode level is adjusted on the production line. Do not touch the variable resistors on the LD unit in the field.

3.5 LD SAFETY SWITCHES



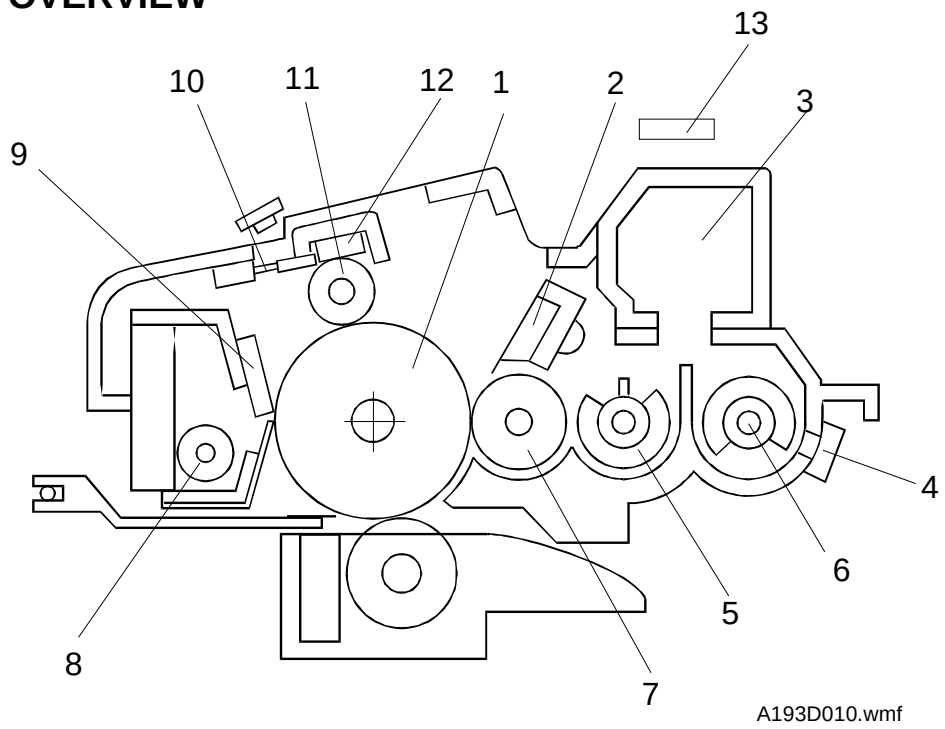
A193D008.wmf

To ensure that the laser beam does not inadvertently expose the drum during servicing, there are two safety switches located at the front cover. These two switches are installed in series on the LD5 V line coming from the dc power supply board.

When the front cover is opened, the power supply to the laser diode is interrupted.

4. PCU (PHOTOCONDUCTOR UNIT)

4.1 OVERVIEW

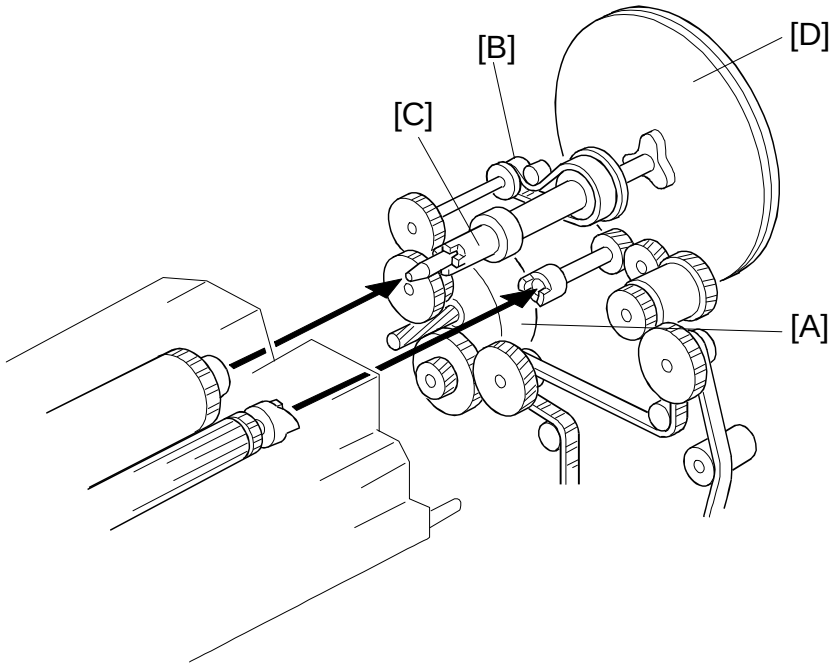


The PCU consists of the components shown in the above illustration. An organic photoconduntor (OPC) drum (diameter: 30 mm) is used in this machine.

1. OPC Drum
2. Doctor Blade
3. Developer Cartridge
4. TD Sensor
5. Mixing Auger 1
6. Mixing Auger 2
7. Development Roller
8. Toner Collection Coil
9. Cleaning Blade
10. Charge Roller Thermistor
11. Charge Roller
12. Charge Roller Cleaning Pad
13. Humidity Sensor

The output of the humidity sensor is used for toner density control processing.

4.2 DRIVE MECHANISM

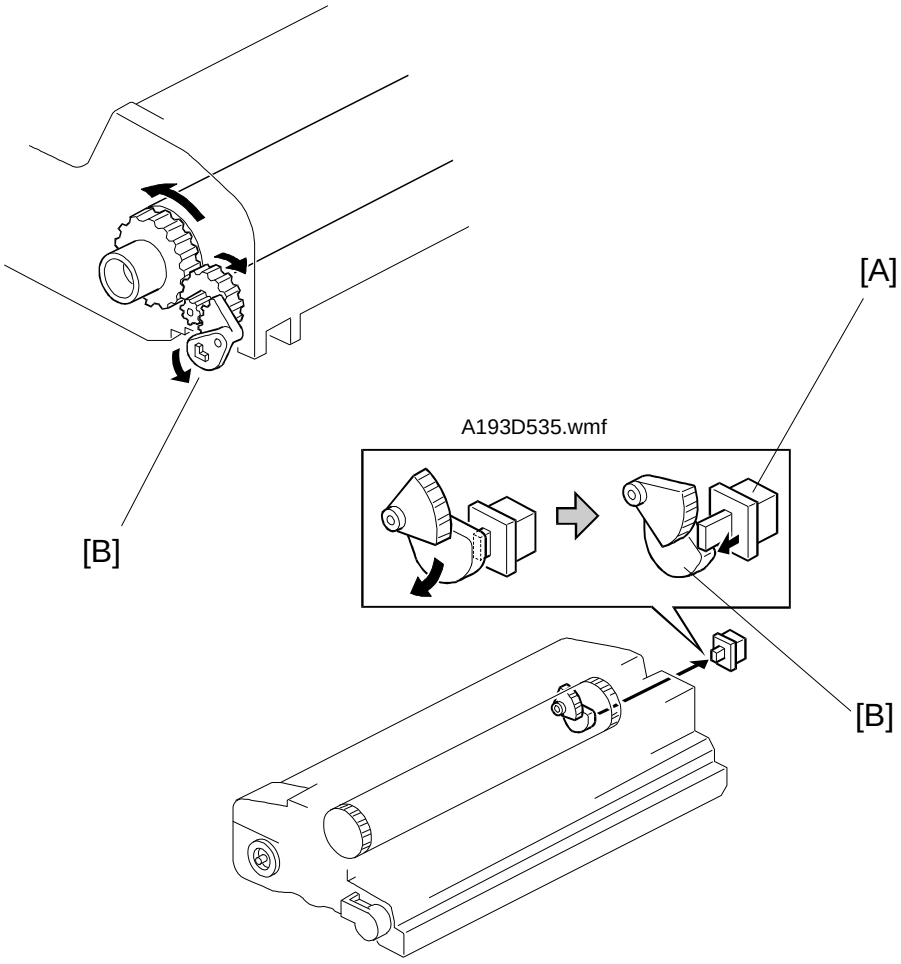


A193D542.wmf

The drive from the main motor [A] is transmitted to the drum through a series of gears, a timing belt [B], and the drum drive shaft [C]. The main motor has a drive controller, which outputs a motor lock signal when the rotation speed is out of the specified range.

The fly-wheel [D] on the end of the drum drive shaft stabilizes the rotation speed (this prevents banding and jitter from appearing on copies).

4.3 NEW PCU DETECTION MECHANISM



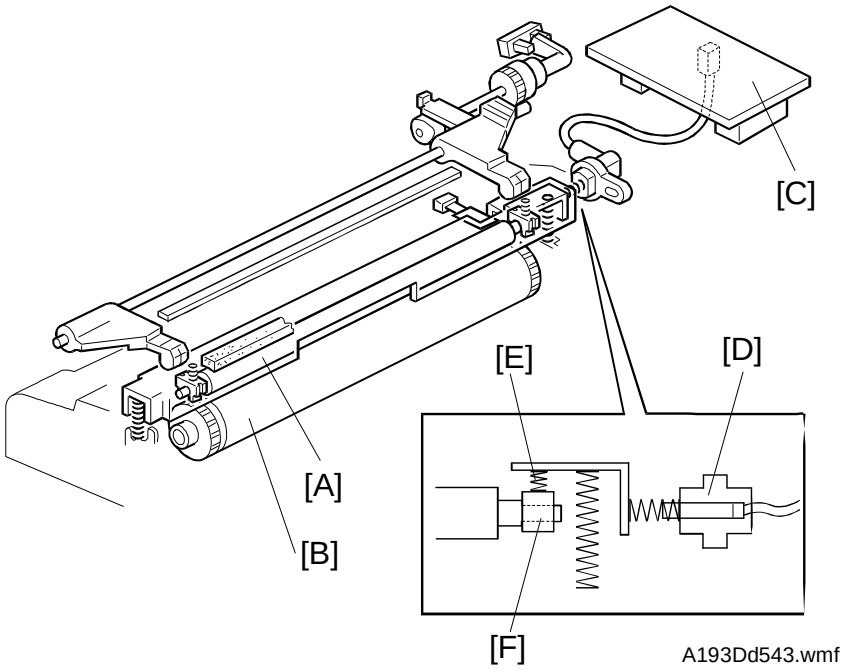
A193D536.mwf

The PCU sensor [A] detects when a new PCU is installed. Each PCU has an actuator. When a new PCU is installed in the machine, the actuator [B] pushes the PCU sensor. The actuator is a sector gear, and this gear engages with the drum gear. When the drum rotates, the actuator is released from the drum gear. The actuator drops away from the PCU sensor and remains in this "down" position for the duration of the PCU's life.

The machine recognizes when a new PCU has been installed in the machine because the actuator of the new PCU contacts the PCU sensor. After the front cover is closed, the machine then performs the TD sensor initial setting procedure automatically (for about two minutes). During this time, the drum rotates and the actuator drops away from the sensor.

4.4 DRUM CHARGE

4.4.1 Overview



This copier uses a drum charge roller system instead of a corona wire scorotron system to charge the drum. For the copy image area or during roller cleaning, the drum charge roller [A] contacts the surface of the drum [B] to give it a negative charge.

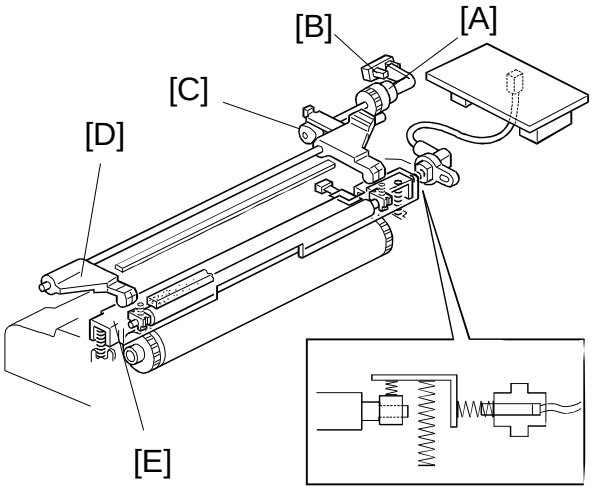
The drum charge roller system has the following advantages over the corona wire scorotron charge system.

- The amount of ozone generated during drum charging is less than about 1/10 of that for a corona wire scorotron system.
- The applied voltage is 1/2 ~ 1/3 that of a corona wire scorotron system.
- The efficiency of drum charge is high.

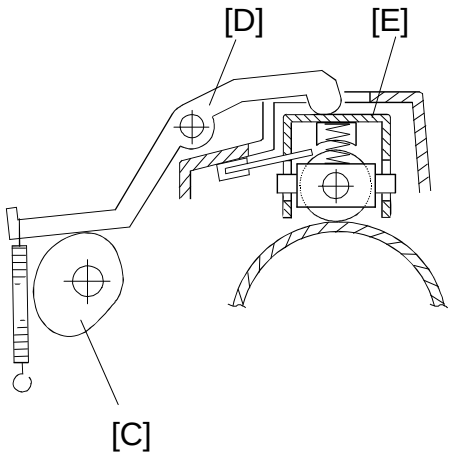
Due to these advantages, no ozone filter is required in this copier.

The high voltage supply board [C] gives a negative dc voltage to the drum charge roller through the charge roller terminal [D], rear pressure spring [E], and the rear roller bushing [F]. This gives the drum surface a negative charge of –900 V.

4.4.2 Charge Roller Contact Mechanism



A193D543.wmf



A193D014.wmf

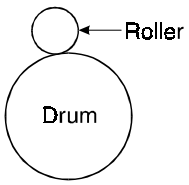
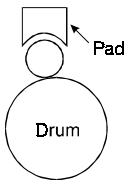
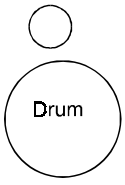
To prevent toner from adhering to the drum charge roller and to prevent the drum charge roller from sticking to the drum, the drum charge roller contacts the drum only under the following conditions:

- When the image processing area comes under the drum charge roller
- During charge roller cleaning

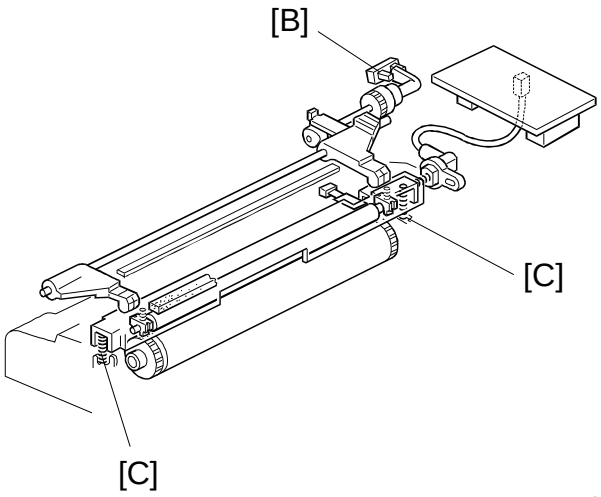
This function is performed by the charge roller contact clutch [A] (a one-third turn clutch) charge roller H.P. sensor [B], and cam [C] located at the end of the clutch shaft. When the clutch is driven one third of a complete rotation, the pressure lever [D] riding on the cam presses down the drum charge roller unit [E] to contact the roller with the drum.

When the drum charge roller contacts the drum, the drum charge roller is turned by the drum.

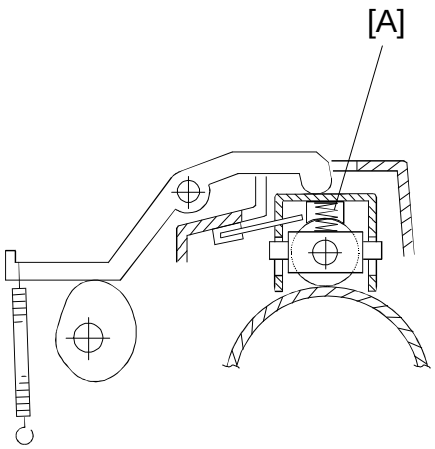
The following table shows the relationship between the clutch rotation and each processing mode.

Mode	Copying	Cleaning (see next page)	Home Position
Clutch	1/3 turn	1/3 turn	1/3 turn
Charge Roller Position			
Charge Roller Contact H.P. Sn	OFF	OFF	ON

4.4.3 Drum Charge Roller Cleaning



A193D544.wmf



A193D015.wmf

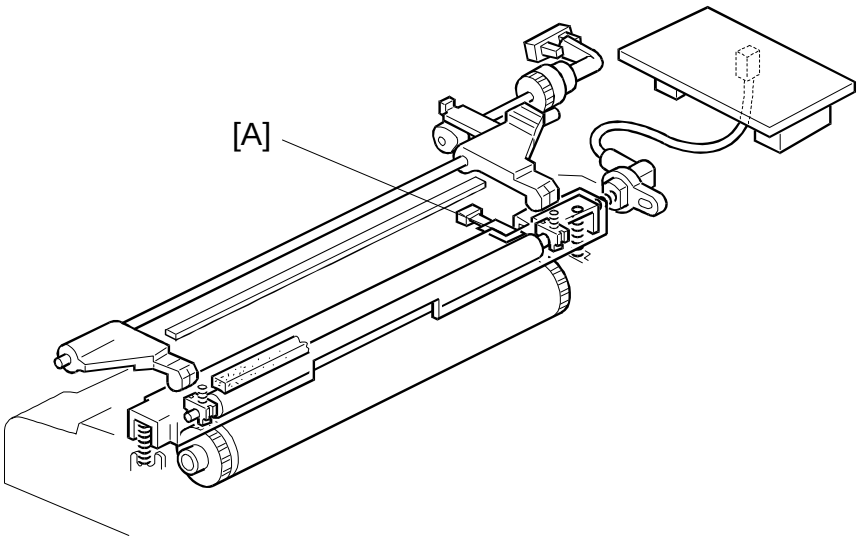
If the drum charge roller gets dirty, drum charge efficiency decreases. This affects the copy quality, for example causing vertical black lines.

Drum charge roller cleaning is done for 2 seconds after every copy job.

After the copy job, the charge roller contact clutch is driven another third of a rotation (see the diagram at the bottom of the previous page). The pressure lever presses down more, so that the cleaning pad [A] contacts the charge roller.

After charge roller cleaning, the clutch is driven the final third of the rotation (until the charge roller H.P sensor [B] is activated) to release the charge roller from the drum. The pressure lever moves away from the charge roller unit. Then the charge roller unit is released from the drum by the spring [C].

4.4.4 Temperature Compensation



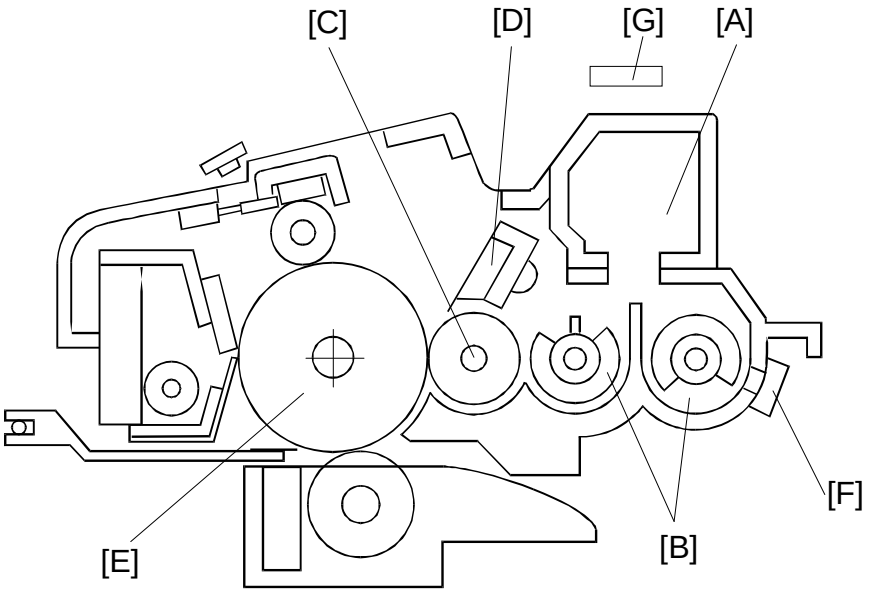
A193D012-3.wmf

The voltage transferred from roller to drum varies with the temperature around the drum charge roller. The lower the temperature is, the higher the applied voltage required.

To compensate for this, the drum charge thermistor [A] detects the temperature around the drum charge roller. Before the copy job starts, the CPU monitors the temperature and instructs the high voltage supply board to correct the charge voltage in accordance with the temperature.

4.5 DEVELOPMENT

4.5.1 Overview



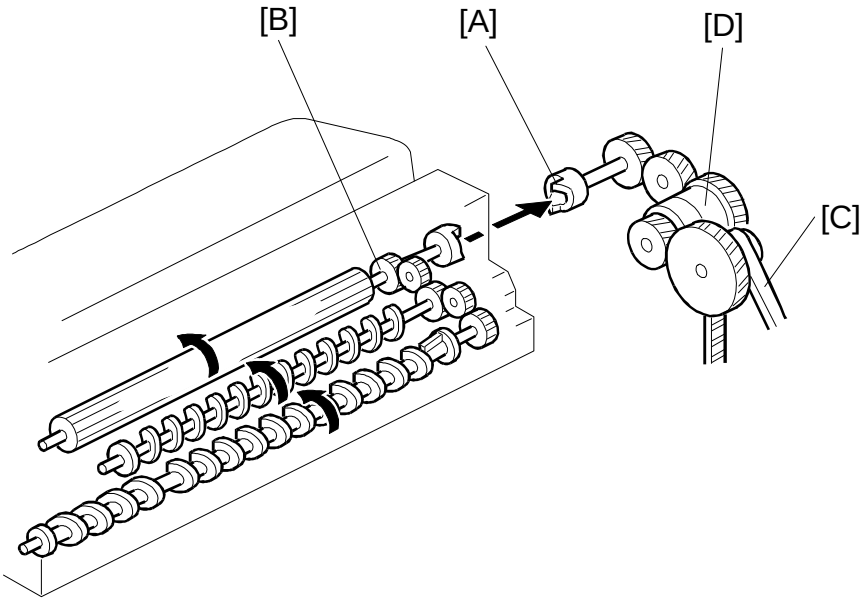
A193D010-3.wmf

This copier uses a single roller development system.

The developer cartridge [A], which includes the developer, is just above the development unit section of the PCU. At machine installation, the developer falls into the development unit. The mixing augers [B] transport the developer and toner to the development roller [C]. Internal permanent magnets in the development roller attract the developer to the development roller sleeve. The development roller carries the developer past the doctor blade [D]. The doctor blade trims the developer to the desired thickness and creates backspill into the mixing mechanism. The development roller continues to turn, carrying the developer to the drum [E] where the latent image is developed.

The toner density sensor [F], located on the side of the development unit, measures the toner concentration in the developer. The humidity sensor [G] measures the humidity level around the drum.

4.5.2 Drive Mechanism

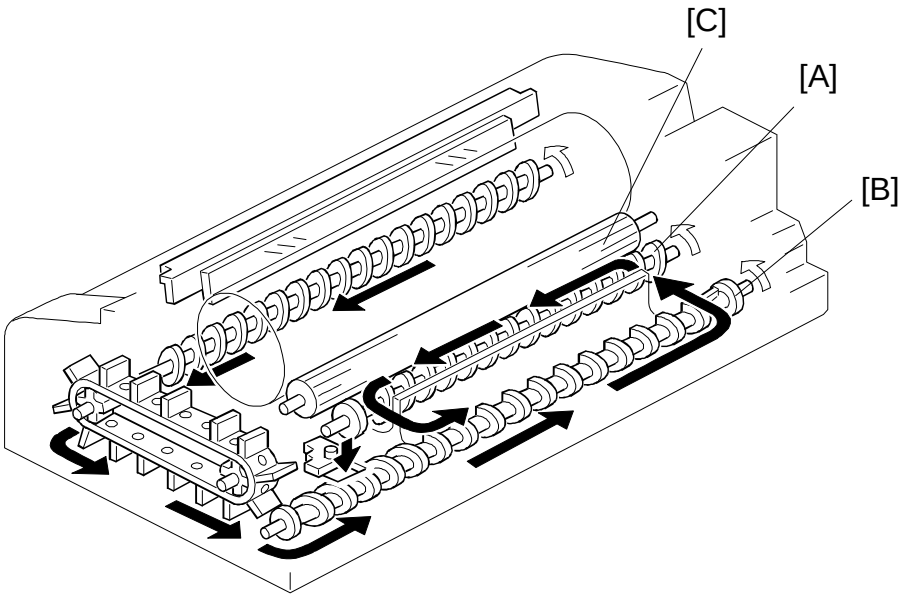


A193D017.wmf

When the development clutch [D] turns on, main motor drive is transmitted to the development drive shaft [A] and the development drive gear [B] through a timing belt [C], and a train of gears.

The development drive gears (except for the gears in the development unit) are helical gears. These gears are quieter than normal gears. When the PCU is pushed in, the development drive shaft engages the development roller gear.

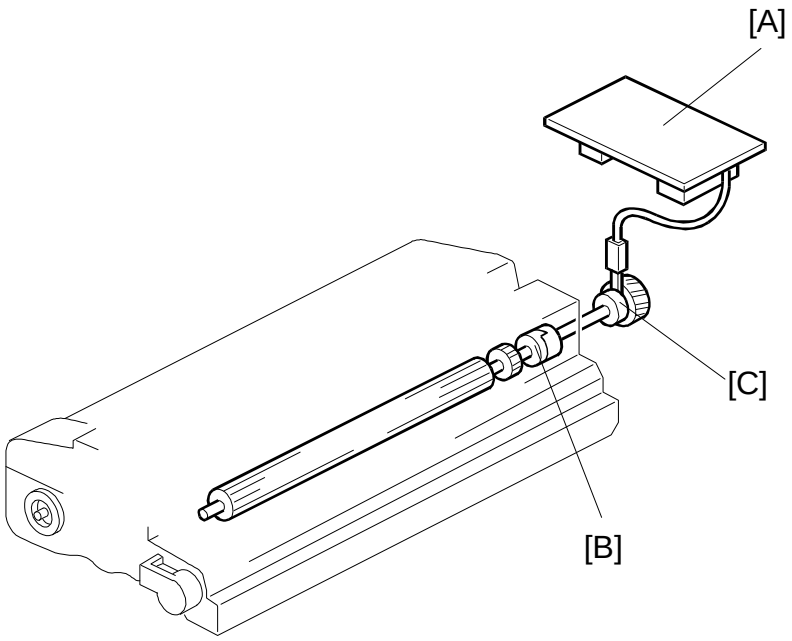
4.5.3 Mixing



A193D016.wmf

This copier uses 2 mixing augers, [A] and [B], to keep the developer evenly mixed. Mixing auger 1 [A] transports excess developer, scraped off the development roller [C] by the doctor blade, towards the front of the machine. Mixing auger 2 [B] returns the excess developer, along with new toner, to the rear of the mixing assembly. Here the developer is reapplied to the development roller.

4.5.4 Development Bias



A193D534.wmf

This machine uses a negative-positive development system, in which black areas of the latent image are at a low negative charge (about -140 ± 50 V) and white areas are at a high negative charge (about -900 V).

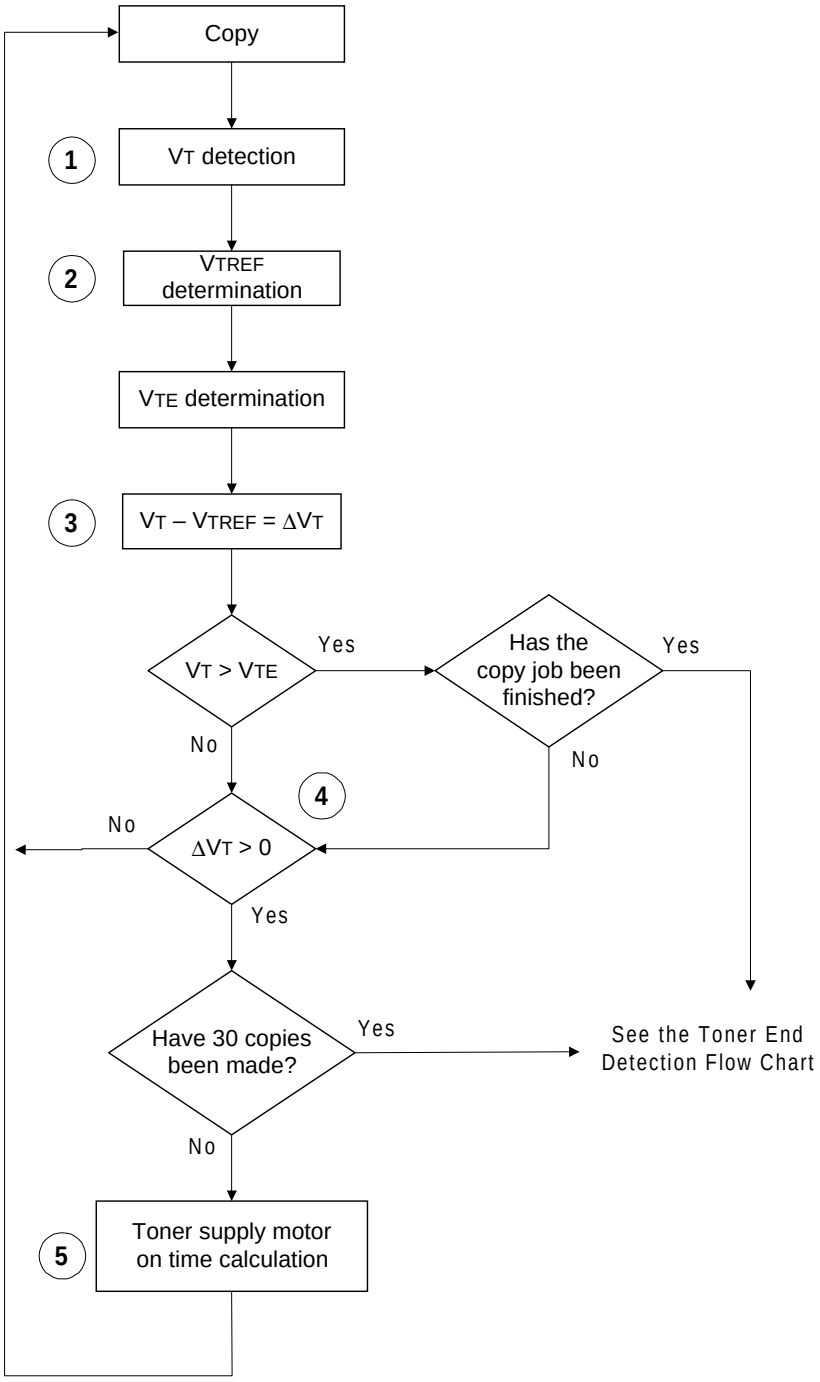
To attract negatively charged toner to the black areas of the latent image on the drum, the high voltage supply board [A] applies a bias of -600 volts to the development rollers throughout the image development process. The bias is applied to the development roller shaft [B] through that shaft's gear [C].

The development bias is kept at 0V until the latent image comes to the development roller. This is to prevent toner from transferring to the area of drum near the development roller, which has not yet been charged. The development bias is then increased to -600 V at the same time as the development clutch turns on.

The development bias voltage (-600 V) can be adjusted with SP2-201.

4.5.5 Toner Density Control

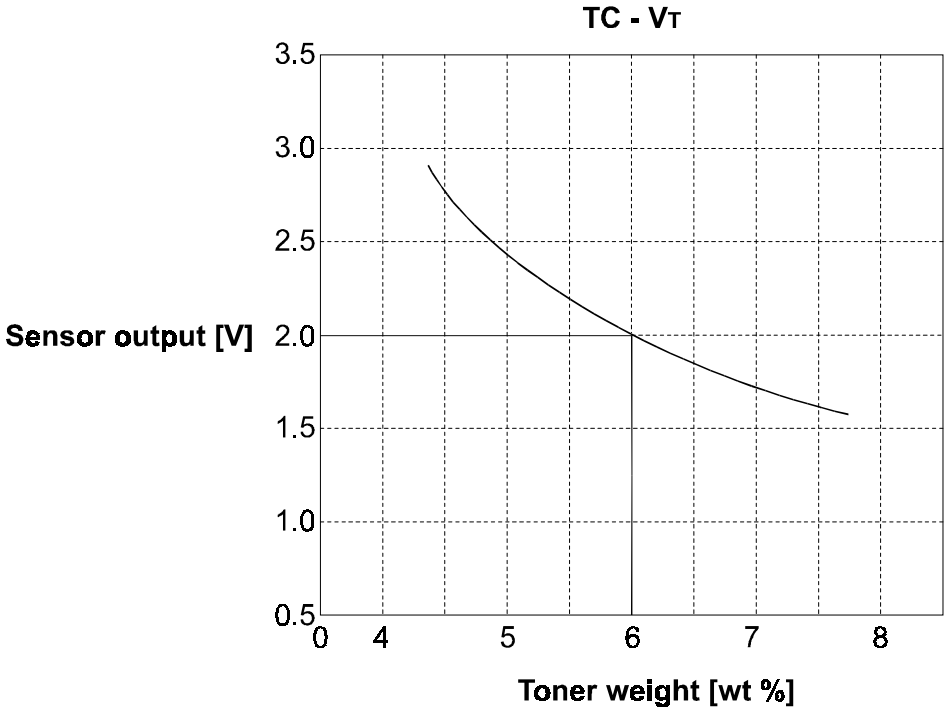
- Toner Density Control Flow Chart -



A193D545.mwf

Each step is explained in more detail on the following pages.

- Toner Density Sensor -



A193D522.wmf

Developer consists of carrier particles (ferrite) and toner particles (resin and pigment). Inside the development unit, developer passes through a magnetic field created by coils inside the toner density sensor, When the toner concentration changes, the voltage output of the sensor changes accordingly.

The output from the sensor (V_T) is checked before every copy. The machine tries to keep V_T constant by varying the toner supply, as shown in the flow chart on the previous page.

- Toner Density Sensor Initial Setting -

The TD sensor initial setting procedure is performed in the factory. During TD initial setting, the machine calibrates the TD sensor control voltage (V_{CONT}) so that the TD sensor output voltage is 2.0 ± 0.1V using new developer with a standard toner concentration (6% by weight, 21.6 g of toner in 360 g of developer). This factory-adjusted value will be used for toner density control processing.

- Toner Density Measurement -

Toner density in the developer is detected once every copy cycle (point "1" on the flow chart). The sensor output voltage (V_T) during the detection cycle is compared with the toner supply reference voltage (V_{TREF}).

- Toner Supply Reference Voltage (V_{TREF}) Determination -

The toner reference voltage (V_{TREF}) is the TD sensor initial setting voltage, corrected for humidity as detected by the humidity sensor (point "2" on the flow chart). To change the image density, the humidity correction coefficient for V_{TREF} can be changed using SP 2-911 (there are five settings). The larger the value entered in this SP mode, the lighter the copies will be.

- Toner Supply Determination -

V_{TREF} is the threshold voltage for determining whether or not to supply toner. If V_T becomes greater than V_{TREF} (points "3" and "4" on the flow chart), the machine supplies additional toner.

- Toner Supply Motor On Time Calculation -

The toner motor on time is decided by the following factors (point "5" on the flow chart).

- ΔV_T (this is V_T - V_{TREF})
- Copy volume counter
- Paper size

The copy volume counter (C_{VOL}) is determined as follows:
0: 1-9 consecutive copies have been made with $\Delta V_T > 0$
1: 10-19 consecutive copies have been made with $\Delta V_T > 0$

If ΔV_T becomes negative at any time (i.e., there is enough toner), C_{VOL} decreases to 0.

The toner motor on times are shown below.

	Paper Length < 250 mm	**Paper Length 250 - 400 mm**	**Paper Length > 400 mm**
$0 < \Delta V_T <= 0.22$, $C_{VOL} = 0$	0.5	0.7	0.9
$0 < \Delta V_T <= 0.22$, $C_{VOL} = 1$	1.0	1.3	1.8
$\Delta V_T > 0.22$, $C_{VOL} = 0$ or 1	1.0	1.3	1.8

NOTE: The toner supply amount is 0.1 g for 0.5 s

4.5.6 Toner Supply in Abnormal sensor Conditions

There are two service codes for a TD sensor error. These SC conditions can be cleared by turning the main switch off and on again. After doing this, the machine automatically performs the TD sensor initial setting.

1. TD sensor error 1

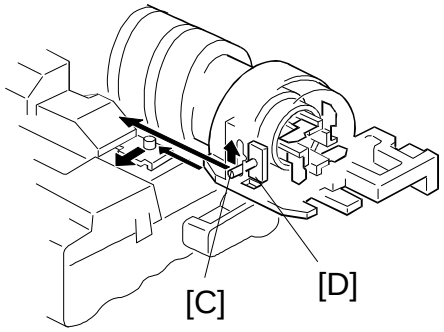
When the TD sensor output voltage (V_T) is less than 0.5 V, 20 seconds after the TD sensor initial setting has been performed, SC390 will be generated.

2. TD sensor error 2

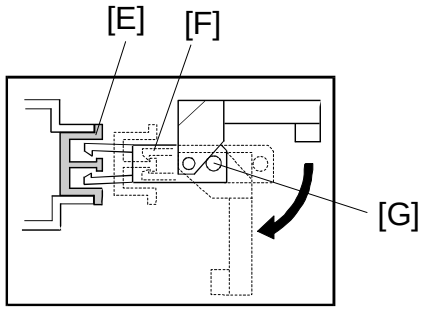
When the TD sensor initial setting is finished, if the TD sensor output voltage (V_T) exceeds the specified range (2 ± 0.2 V), SC393 is generated.

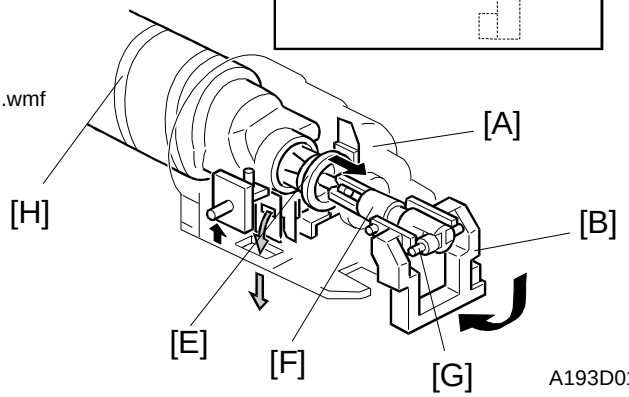
4.5.7 Toner Supply

- Toner Bottle Replenishment Mechanism -



A193D516.wmf





A193D019.wmf

When a toner bottle is placed on the bottle holder unit [A] and pushed back in completely and the toner bottle holder lever [B] is put back in the original position, the following happens automatically to allow toner to be supplied to the development unit.

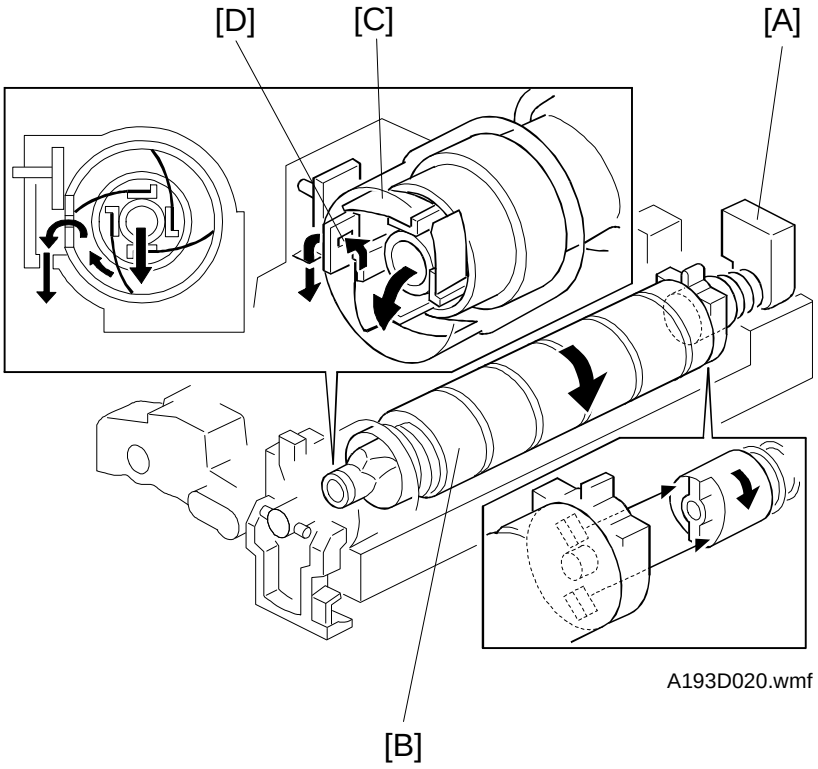
- The pin [C] on the toner shutter [D] is pulled out (opened) as a result of the shape of the developer cartridge.
- The cap [E] remaining on the toner bottle is pulled away and kept by the chuck [F] away from the movement of the roller [G], which rides along the curved rail behind the toner bottle holder lever.

The toner end detection system determines when to drive the toner bottle replenishment mechanism (see Toner End Detection). The toner supply mechanism transports toner from the bottle to the development unit. The toner bottle has a spiral groove [H] that helps move toner to the development unit.

When the bottle holder unit is pulled out to add new toner, the following happens automatically to prevent toner from scattering.

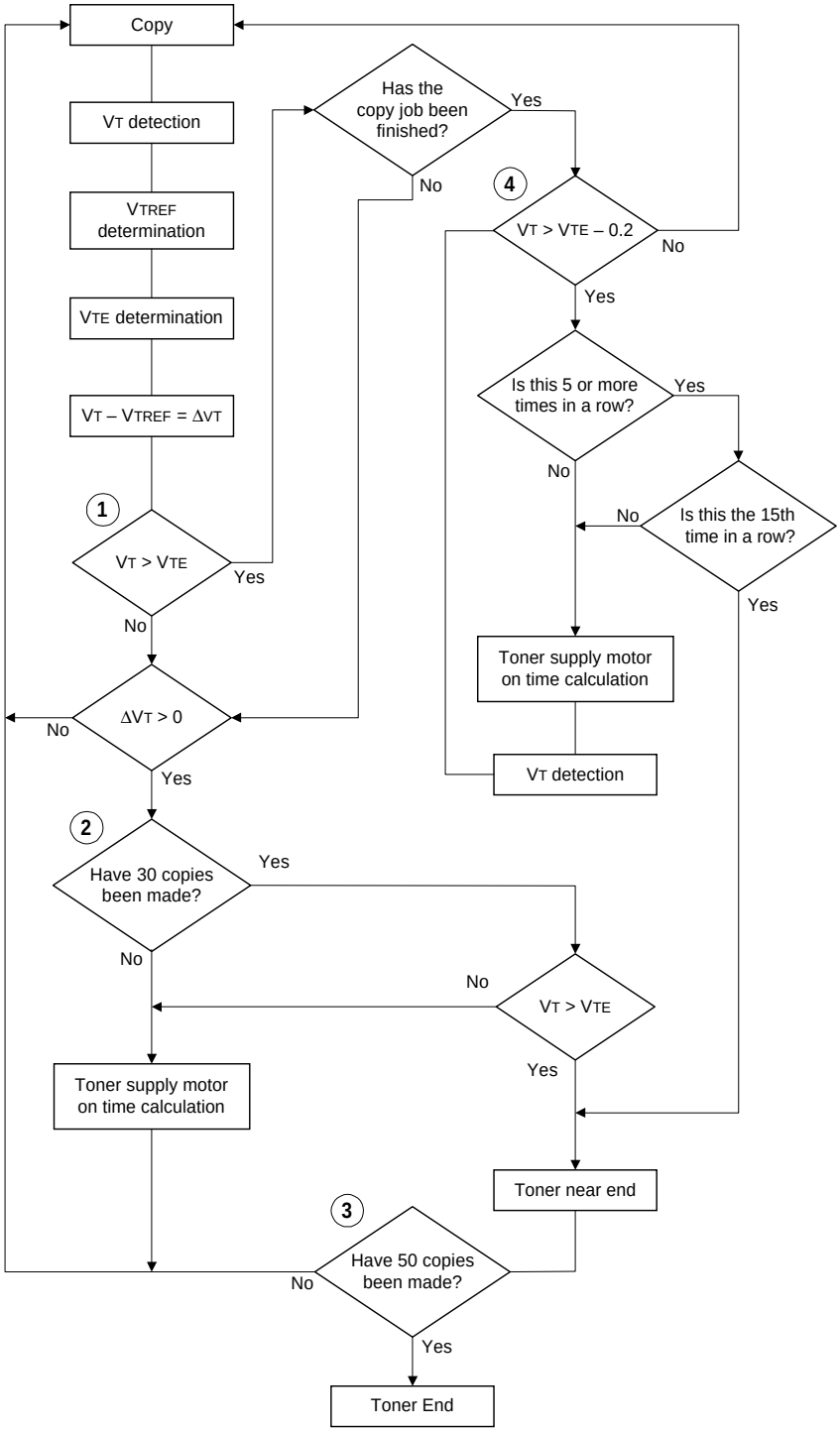
- The chuck releases the toner bottle cap into its proper position.
- The toner shutter shuts the opening as a result of pressure from a spring.

- Toner Supply Mechanism -



The toner supply motor [A] drives the toner bottle [B] and the mylar blades [C]. First, the toner falls down into the toner holder. The toner supply mylar blades transfer the toner to the slit [D], then the toner falls down into the development unit through the opening.

- Toner Near End/End Detection -



A193D541.wmf

There is no toner end sensor in this machine. Instead, toner end/near-end is detected using the TD sensor output data.

The machine checks for toner near end/end every copy. If toner near-end or toner end is detected during the copy job, it is also checked after finishing the copy job. To detect toner near end, the machine first decides the toner end reference voltage (V_{TE}) based on the TD sensor initial setting and the humudity sensor output. Then, the machine compares V_{TE} with the TD sensor output voltage (V_T): this is point 1 on the flow chart.

During a copy job:

If V_T is greater than V_{TREF} (this means the amount of toner in the development unit is low), the machine supplies toner (see Toner Supply).

If toner concentration is still low after 30 copies (point 2 on the flow chart), the machine checks for a toner near end condition (if V_T is greater than V_{TE}, there is a near end condition).

If toner concentration is still low 50 copies after toner near-end was determined (point 3 on the flow chart), the machine detects a toner end condition.

After a copy job:

When the machine detects that toner concentration is low, after the copy job is finished, the machine decreases V_{TE} by 0.2 V and compares the new V_{TE} with V_T ("4" on the flow chart). If the toner concentration is still low, the machine supplies toner. The machine then compares V_{TE} with V_T again, and supplies toner again if V_T is too low.

If the toner concentration is still too low after supplying toner 15 times ("5" on the flow chart), the machine detects a toner near-end condition.

If toner concentration is still low 50 copies after toner near-end was determined ("3" on the flow chart), the machine detects a toner end condition.

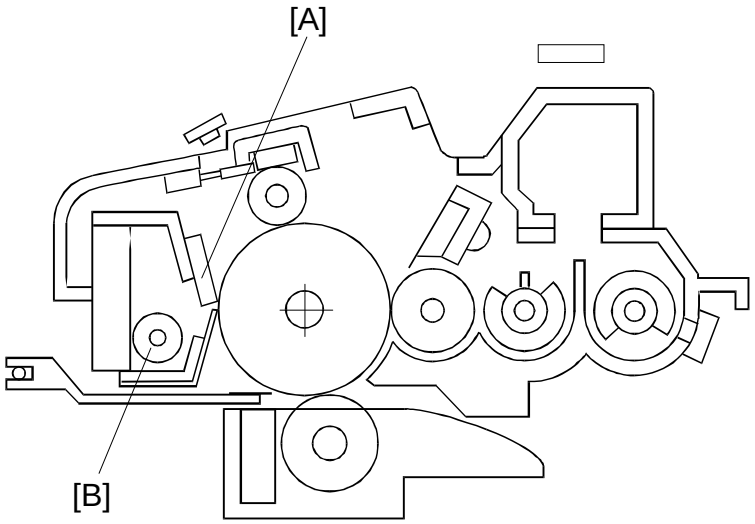
The number of copies between toner near-end and toner end can be changed with SP 2-213. The default is 50.

- Toner End Recovery -

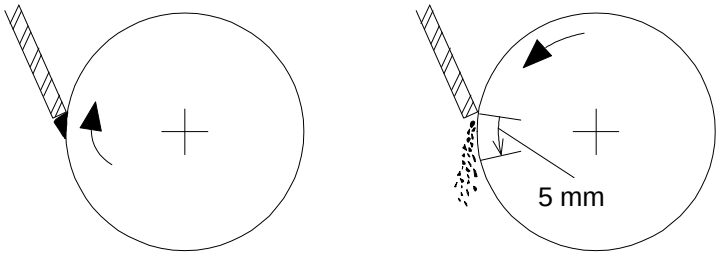
If the front cover is opened and closed for more 10 seconds while a toner near-end/end condition exists and the toner bottle is replaced, the machine will attempt to recover for 3 minutes using the same procedure as for toner near-end/end detection after a copy job.

4.6 DRUM CLEANING AND TONER RECYCLING

4.6.1 Drum Cleaning



A193d010.wmf



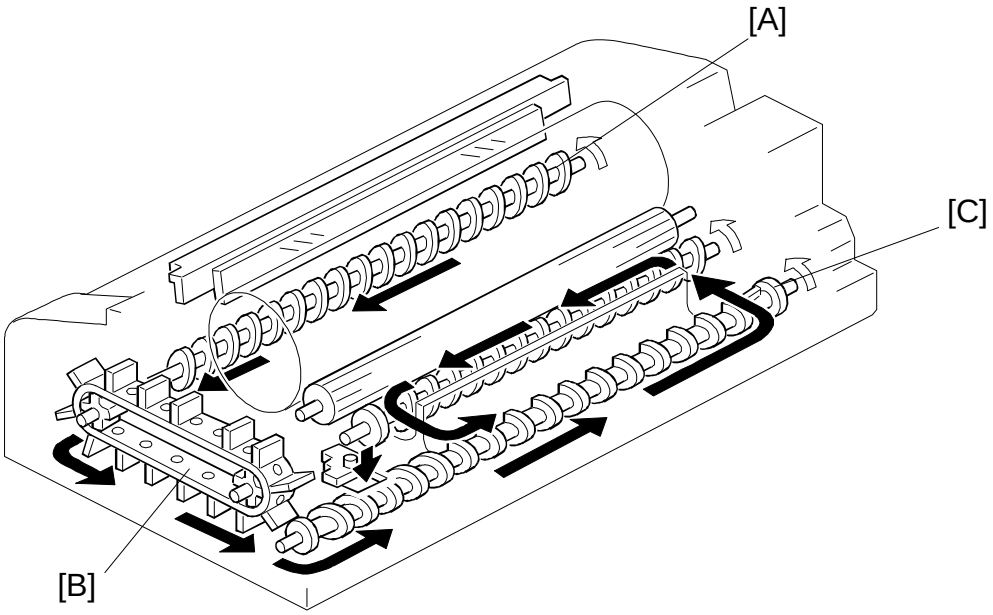
A193D529.wmf

The cleaning blade [A] removes any toner remaining on the drum after the image is transferred to the paper. This model uses a counter blade system.

The toner remaining on the drum is scraped off by the cleaning blade, and it falls onto the toner collection coil [B].

To remove the toner and other particles that are accumulated at the edge of the cleaning blade, the drum turns in reverse for about 5 mm at the end of every copy job, as shown in the illustration. However, this is not done during transfer roller cleaning.

4.6.2 Toner Recycling

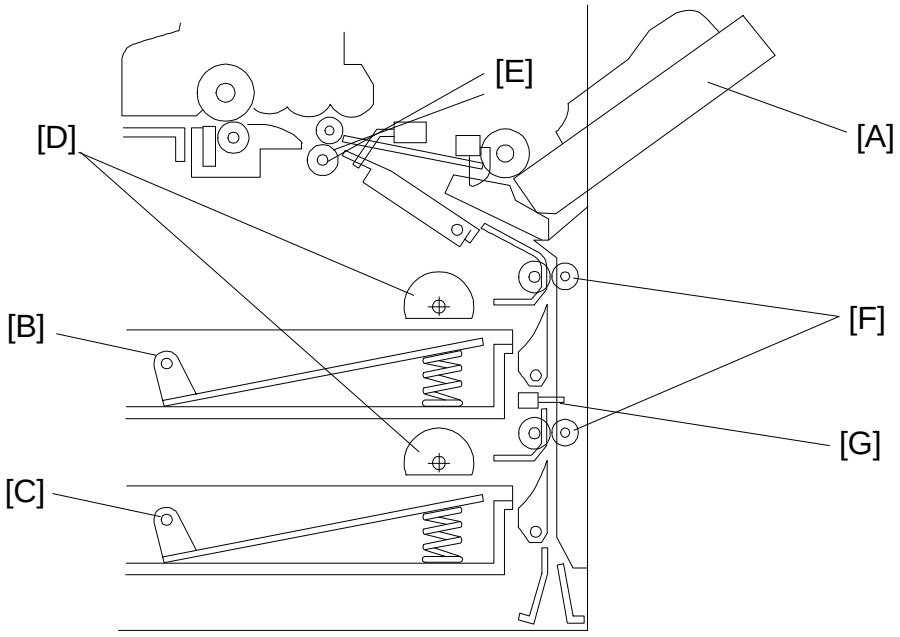


A193D016.wmf

Toner which falls onto the toner collection coil [A] is transported to the recycled toner transport belt [B] at the front of the PCU. The recycled toner transport belt carries the toner to mixing auger 2 [C] in the development unit. This toner is mixed with new toner by mixing auger 2 and used again.

5. PAPER FEED

5.1 OVERVIEW



A193D022.wmf

There are two paper trays and a by-pass feed table [A].

The first [B] and second [C] paper trays each hold 250 sheets. The by-pass feed table can hold 1, 10, or 100 sheets of paper, depending on the paper size.

The semicircular feed rollers [D] drive the top sheet of paper from the tray to the registration rollers [E] through the relay rollers [F].

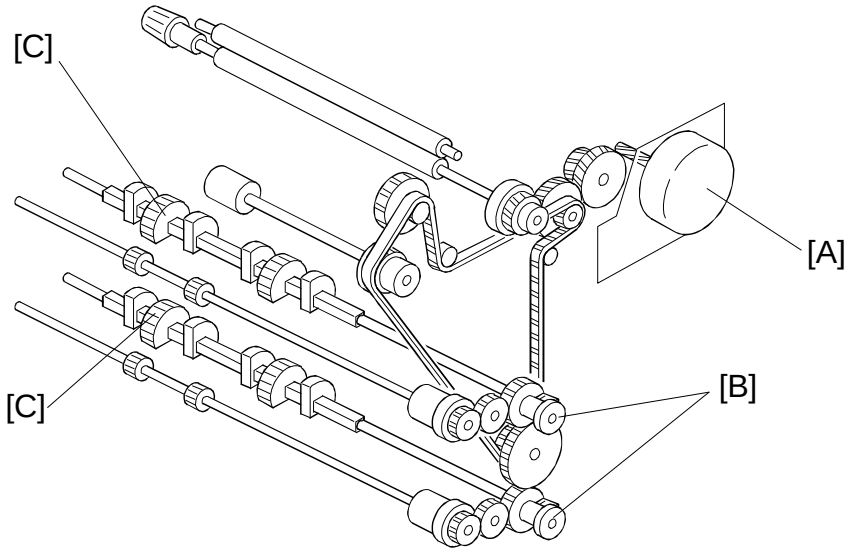
The tray has two corner separators (see [F] in the diagram in the "Paper Lift Mechanism" section), which allow only one sheet to feed at a time. The corner seperators, along with the tray's springs, also serve to set the height of the paper stack.

When the tray is closed after the paper is loaded, the paper size actuator located at the front right of the tray pushes the paper size sensor. This informs the cpu what paper size is loaded in the tray and that the tray is in place.

There is a relay sensor [G] located between the relay rollers. This sensor is used for paper jam detection.

5.2 PAPER TRAY

5.2.1 Paper Feed Drive Mechanism

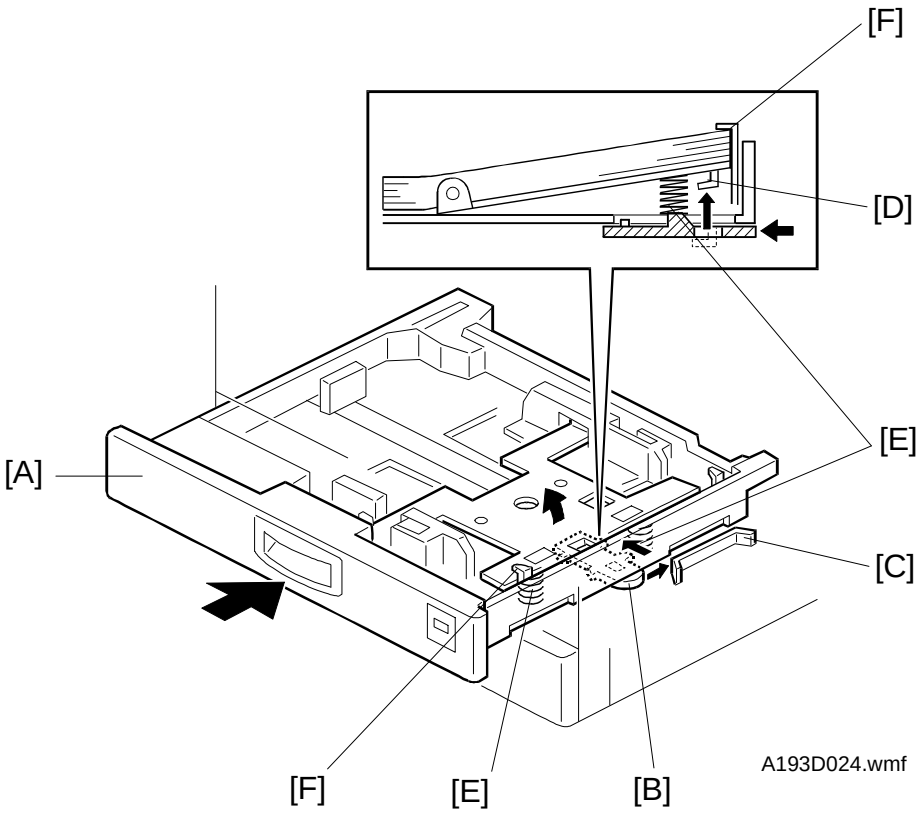


A193D033.wmf

The main motor [A] drives the pick-up and feed mechanism of both the first and second paper trays. The paper feed clutches [B] transfer drive from this motor to the feed rollers [C].

The paper feed clutch turns on and the feed rollers start rotating to feed the paper. The paper feed clutch stays on for enough time to turn the paper feed rollers only once.

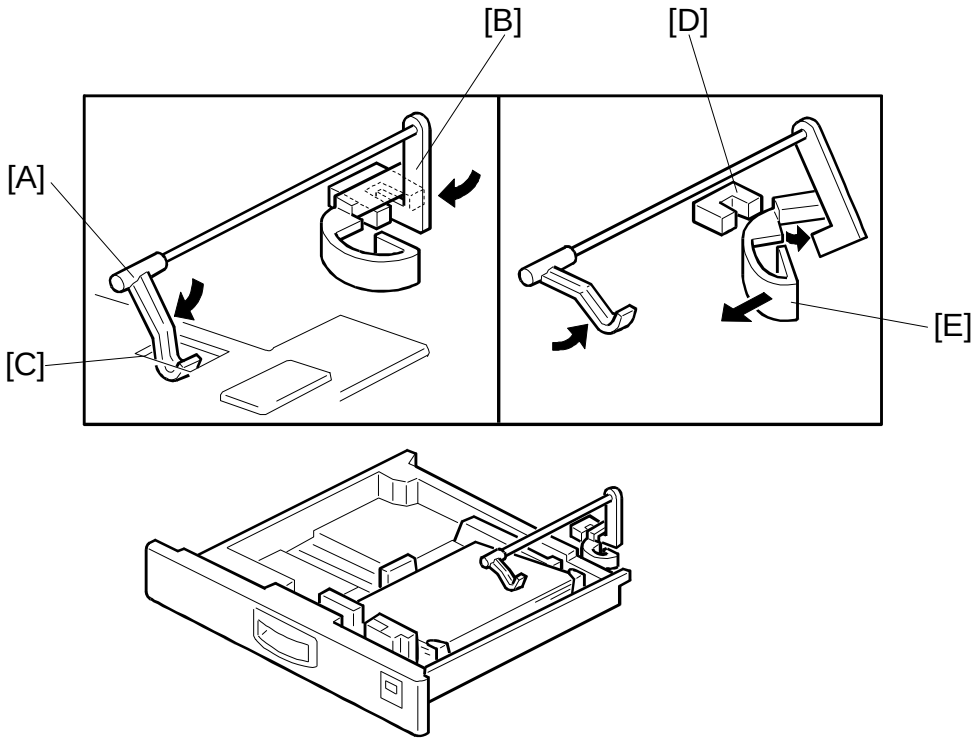
5.2.2 Paper Lift Mechanism



When the paper tray [A] is closed after paper is loaded, the release slider [B], which is mounted on the bottom part of the tray, is pushed by the projection [C] on the main frame and the release slider comes off the bottom plate hook [D].

Once the release slider comes off, the bottom plate is raised by the pressure springs [E] and the top sheet pushes up the corner separators [F]. This keeps the stack of paper at the correct height.

5.2.3 Paper End Detection

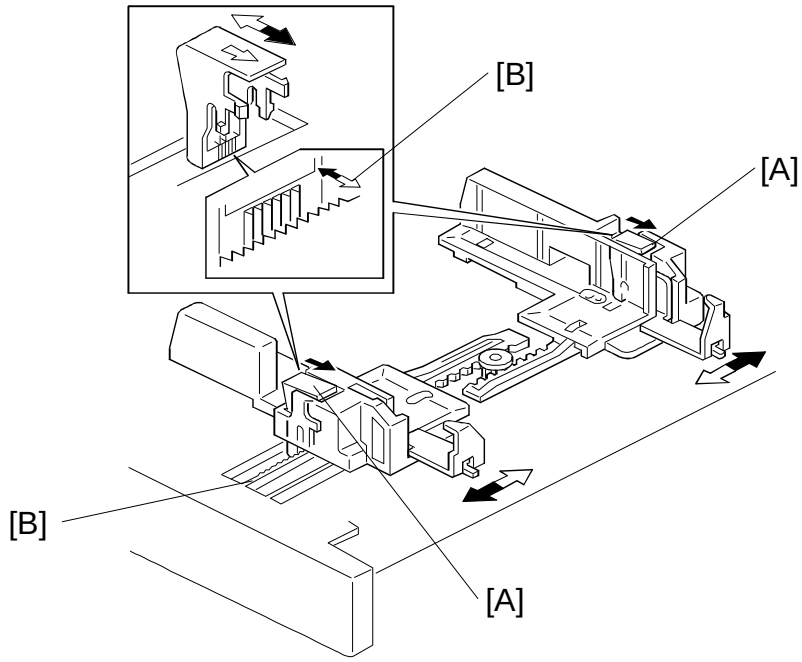


A193D027.wmf

The paper end feeler [A] is on the same shaft as the paper end actuator [B]. When the paper tray runs out of paper, the paper end feeler drops into the cutout [C] in the tray bottom plate. The paper end actuator activates the paper end sensor [D].

The paper end actuator is in contact with the lever [E]. When the tray is drawn out, the lever turns as shown by the arrow in the figure. Then the lever pushes up the actuator. As a result, the feeler rotates upwards. This mechanism is necessary to prevent the feeler from getting damaged by the paper tray body.

5.2.4 Side Fence Double Stopper Mechanism



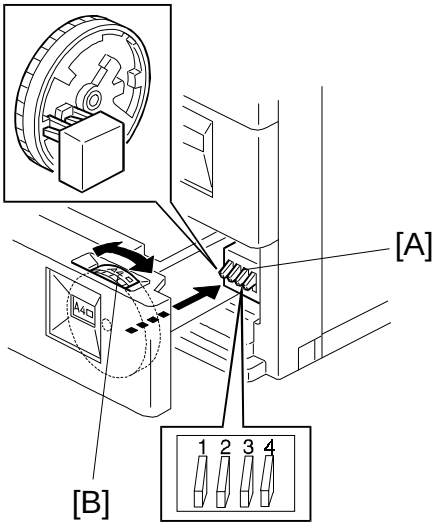
A193D026.wmf

There is a side fence stopper mechanism for both the front and rear side fences.

If the tray is closed with excessive force after loading paper, paper may come over the rear side fence, because the fence is deformed by the weight of the paper leaning against it. As a result, skewing or paper jams may occur. To prevent this, a side fence stopper mechanism has been added to the rear side fence also.

The release levers [A] each have a stopper which contains teeth like those on a gear. The guide rails [B] also have teeth. When the release lever is pushed, the gear teeth release each other and the side fences can be moved.

5.2.5 Paper Size Detection



SW / Size	1	2	3	4
A3, F(8 1/2"x13")	●	●	●	❍
A4 Lengthwise	●	❍	●	❍
A4 Sideways	●	●	❍	❍
A5 Sideways, 11"x17"	●	❍	❍	❍
B4, 8 1/2"x14"	❍	●	❍	❍
B5 Sideways, 8 1/2"x11"	❍	❍	❍	❍
B5 Lengthwise, 11"x8 1/2"	❍	❍	●	❍
* (Asterisk)	❍	❍	●	●

A193D025.wmf ●: ON (Not pushed) ❍: OFF (Pushed)

There are four paper size sensors (microswitches) [A] on the front right plate of the main frame. The sensors are actuated by a paper size actuator [B] behind the paper size indicator plate which is on the front right of the tray.

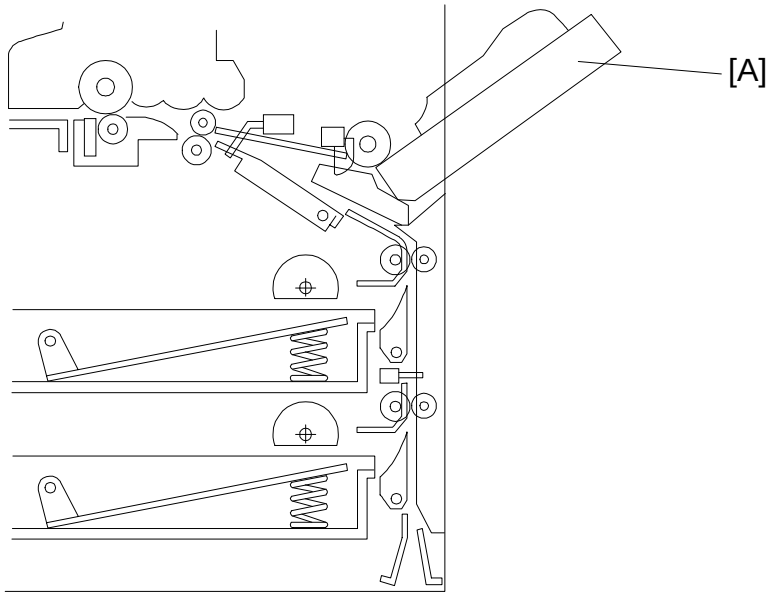
Each paper size has its own actuator, with a unique combination of notches. To determine which size tray has been installed, the cpu reads which micro switches have been switched off by the actuator.

The cpu disables paper feed from a tray if the paper size cannot be detected. If the paper size actuator is broken, or if there is no tray installed, the Add Paper indicator will light.

When the paper size actuator is at the "*" mark, the paper tray can be set up to accommodate one of a wider range of paper sizes by using a User Tool. If the paper size for this position is changed without changing the User Tool setting, a paper jam will result.

5.3 BY-PASS FEED

5.3.1 Overview



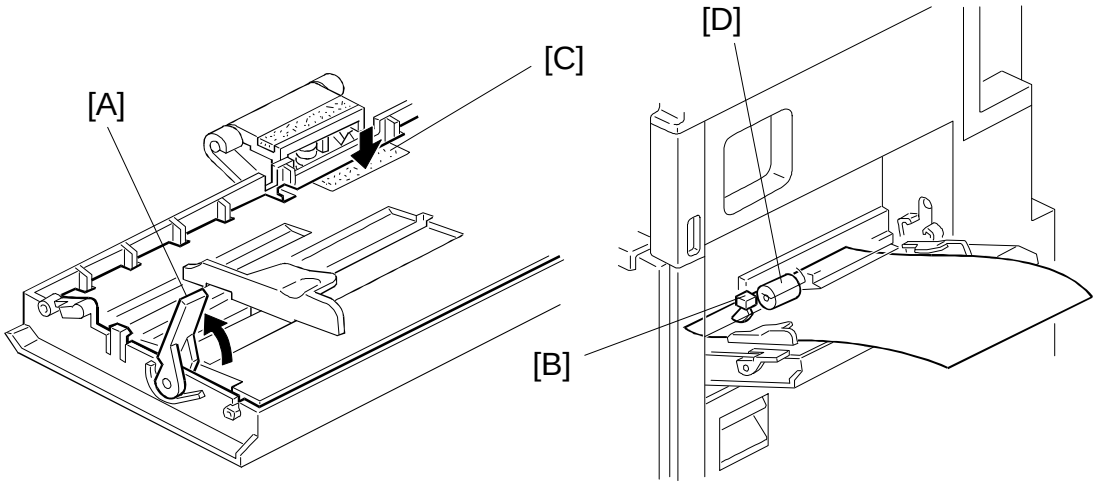
A193D022-2.wmf

The by-pass feed table [A] can hold 100 sheets of paper.

This machine does not have a by-pass feed cover sensor. The by-pass feed indicator is always displayed on the LCD. The Add Paper indicator will light when the user selects by-pass feed while the by-pass feed table is closed or if there is no paper on the by-pass feed table.

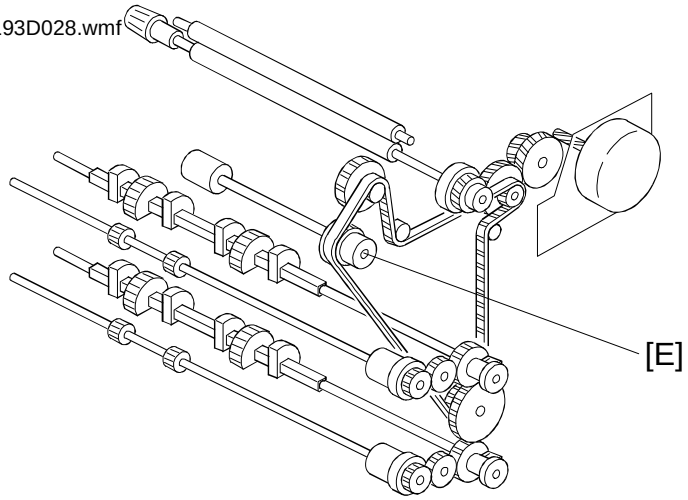
After the Start key is pressed, the cpu energizes the by-pass feed clutch and the by-pass feed roller starts to feed paper to the registration roller.

5.3.2 Paper Feed Mechanism and Paper End Detection



A193D029.wmf

A193D028.wmf



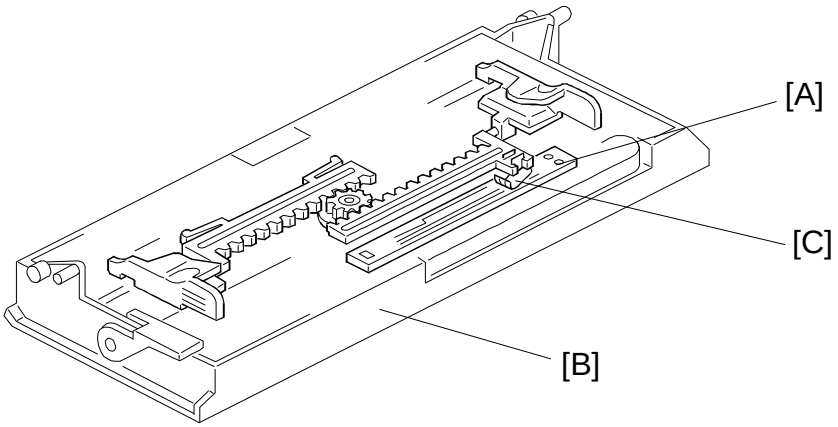
A193D033-2.wmf

This machine uses a feed roller and friction pad mechanism, with drive from the main motor transmitted when the by-pass feed clutch [E] turns on. The friction pad prevents all but the top sheet from feeding. Therefore, during paper feed, the top sheet of paper is separated from the stack and fed to the registration rollers.

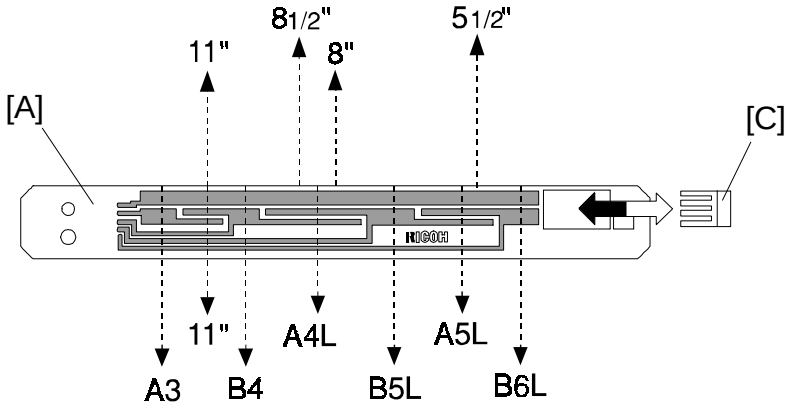
Before placing the paper on the by-pass feed table, the user must lower the by-pass feed table by using the lever [A]. This is to ensure that the paper is placed between the friction pad [C] and the feed roller [D]. Then, before starting to copy, it must be put back up to move the paper stack into contact with the feed roller.

When there is no paper on the by-pass feed table, the paper end feeler [B] drops into the cutout in the by-pass feed table and the by-pass feed paper end sensor is activated.

5.3.3 By-pass Feed Paper Width Detection



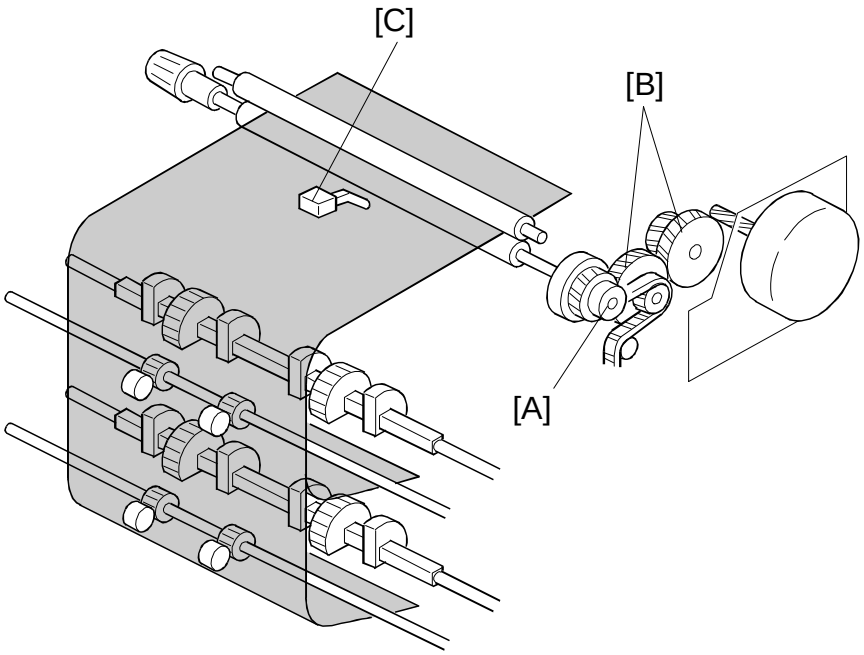
A193D030.wmf



A193D524.wmf

The paper width switch [A] is a slide switch located inside the by-pass feed table [B]. It measures the paper width manually. The rear side fence is connected to the terminal plate [C]. When the side fences are moved to match the paper width, the terminal plate slides along the wiring patterns on the detection board. The patterns for each paper width on the paper width detection board are unique. Therefore, the machine determines which paper width has been placed in the by-pass feed table by the signal output from the board. However, the machine will not determine the paper length. For example, A4 paper set sideways will be determined to be A3 paper.

5.4 PAPER REGISTRATION



A193D032.wmf

Main motor rotation is transmitted to the registration clutch [A] (located on the lower registration roller shaft) through the relay gears [B].

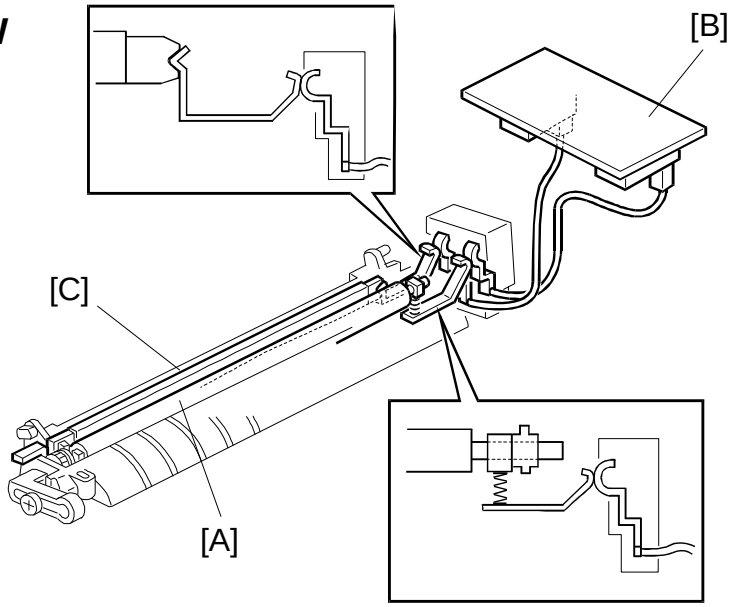
The registration sensor [C] is positioned just before the registration rollers.

When the paper leading edge activates the registration sensor, the registration clutch turns off and the registration rollers stop turning. However, the relay clutch stays on for a bit longer. This delay allows time for the paper to press against the registration rollers and buckle slightly to correct skew. The registration clutch energizes and the relay clutch re-energizes at the proper time to align the paper with the image on the drum. The registration and relay rollers feed the paper to the image transfer section.

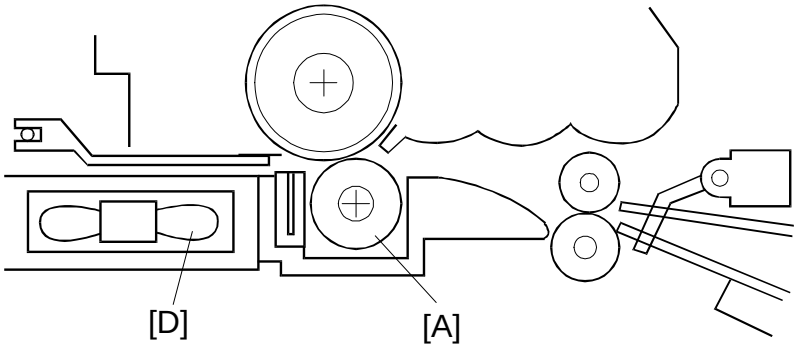
The registration sensor is also used for paper misfeed detection.

6. IMAGE TRANSFER AND PAPER SEPARATION

6.1 OVERVIEW



A193D538-2.wmf



A193D021.wmf

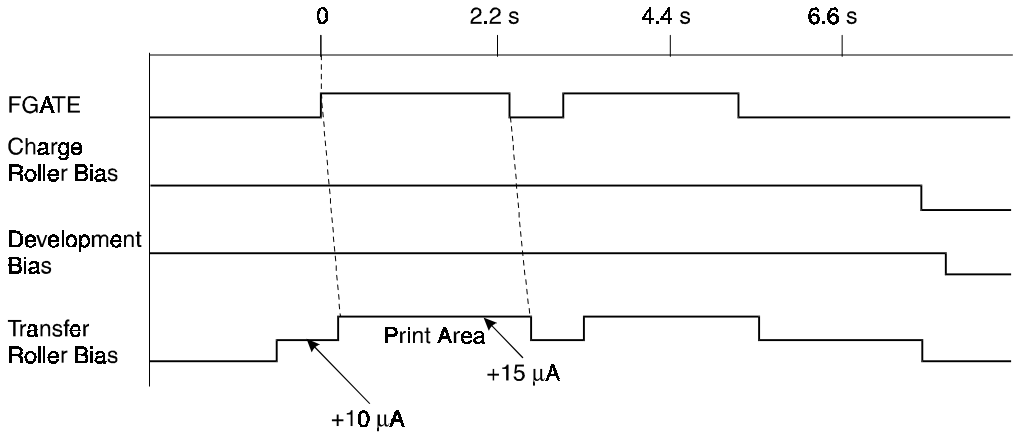
Instead of using a transfer wire and a transfer belt, this machine uses a transfer roller [A], which touches the drum surface.

The high voltage supply board [B] supplies a positive current (approximately +15 μA) to the transfer roller. The roller has a high electrical resistance, so it can hold a high positive electrical potential to attract toner from the drum onto the paper.

There is a discharge brush [C] after the transfer roller. The curvature of the drum and the discharge brush helps the paper to drop away from the drum.

The transport fan [D] under the transport guide plate helps to transport the paper from the transfer area to the fusing unit.

6.2 IMAGE TRANSFER AND PAPER SEPARATION MECHANISM



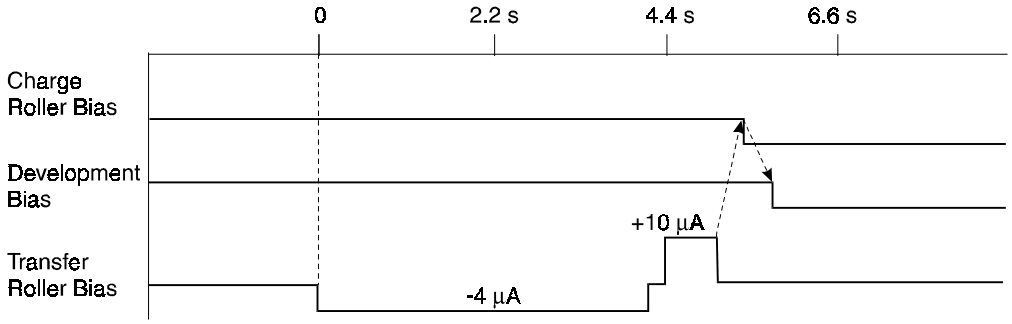
FGATE: Laser main scan writing start signal

A193D530.wmf

The transfer roller starts rotating at the same time as the main motor starts to rotate.

1. When the CPU receives the image writing start signal (FGATE signal), the CPU instructs the power pack to supply +10 µA (low transfer bias) to the roller. This prevents any positively charged toner on the drum surface from transferring to the transfer roller.
2. At a certain time after the low transfer bias has been supplied to the roller, +15 µA (high transfer bias) is applied to the roller to transfer the toner to the paper.
3. After the trailing edge of the paper has passed through the roller, the transfer bias turns off. In the multiple copy mode, the transfer bias shifts again to the low transfer bias.

6.3 ROLLER CLEANING



A193D531.wmf

If the paper size is smaller than the printed image, or if a paper jam occurs during printing, toner may be transferred to the roller surface. To prevent this toner from transferring to the back side of copies, the transfer roller has to be cleaned before the next printing run.

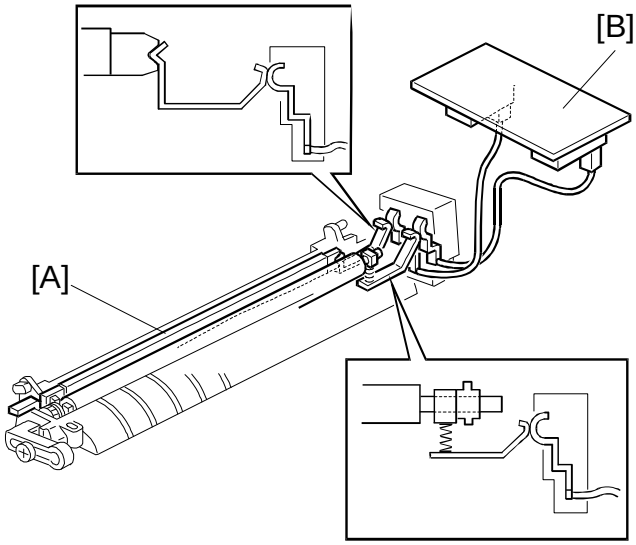
During transfer roller cleaning, the power pack supplies a negative cleaning bias (- 4 µA) to the transfer roller. So, any negatively charged toner on the transfer roller is then transferred back to the drum. Then a positive cleaning bias of +10 µA is applied to transfer back to the drum any toner which was positively charged by the transfer roller.

The machine goes through the cleaning mode in the following conditions:

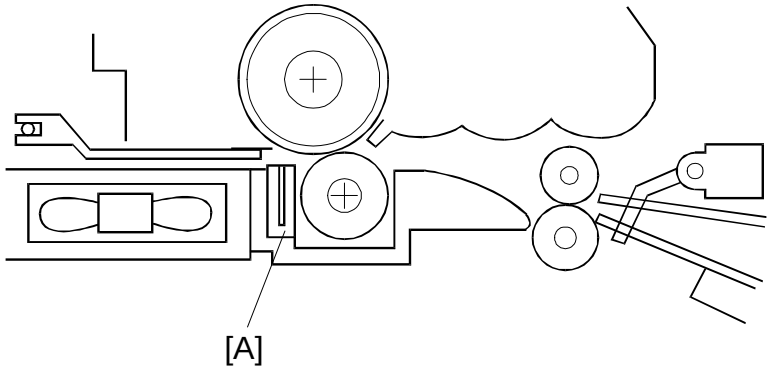
- After a copy job has been finished.
- At the same time as power on.
- After a printer jam has been cleared.

Also, transfer roller cleaning can be done forcibly by SP2-910.

6.4 PAPER SEPARATION AND TRANSPORTATION



A193D538.wmf



A193D021-2

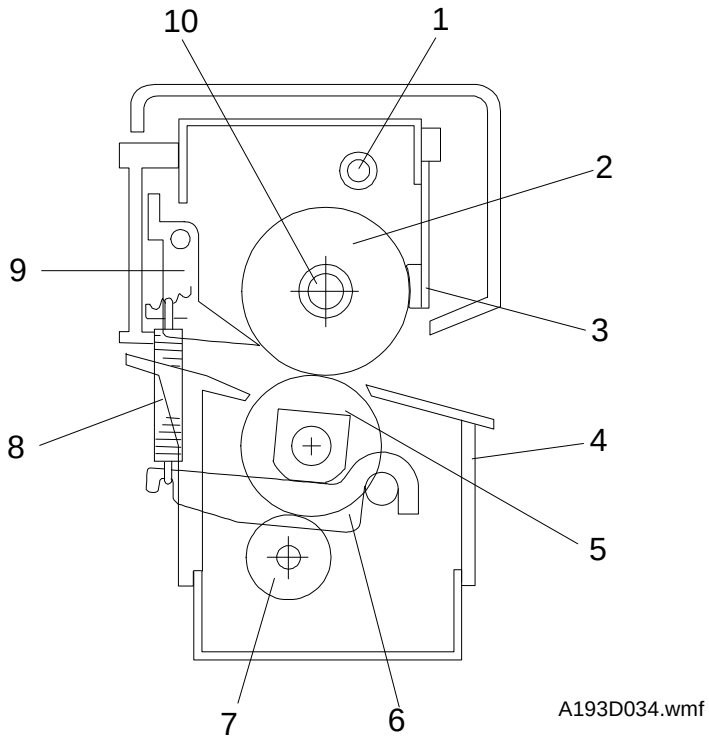
The discharge brush [A] and the curvature of the drum help the paper to drop away from the drum. The high voltage supply board [B] applies a constant dc voltage, +2 kV (when feeding from a paper tray), or +2.5 kV (from the duplex tray) to the discharge brush.

The transport fan helps to transport the paper from the transfer area to the fusing unit. The transport fan turns on at the same time as the main motor. Also, the transport fan turns off at the same time as the main motor.

The discharge brush voltage can be adjusted using SP 2-901 (there are separate settings for the front and rear side, and for the leading edge and other areas of the paper).

7. IMAGE FUSING

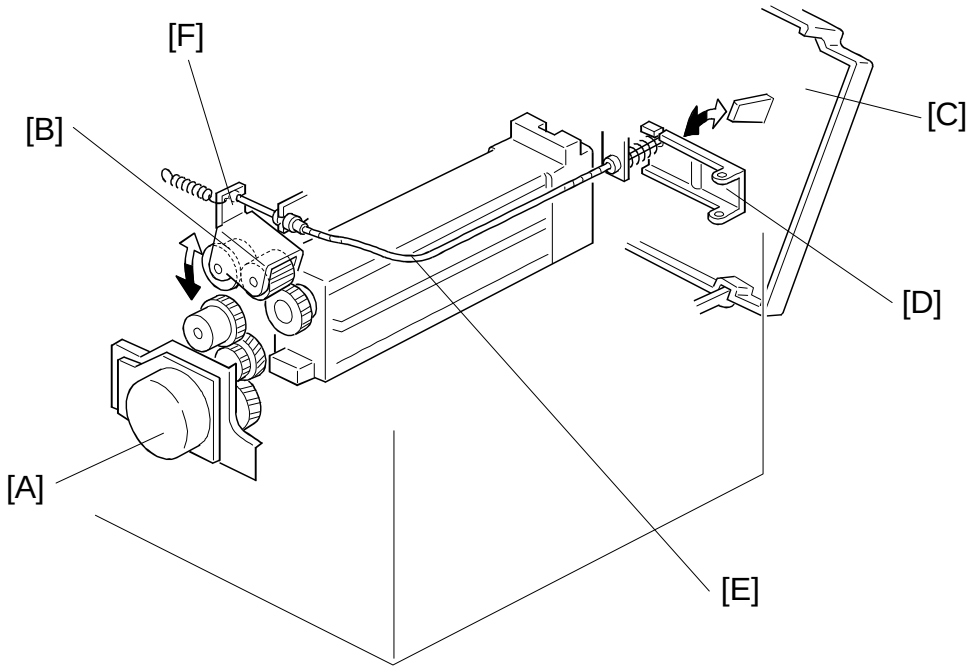
7.1 OVERVIEW



The fusing unit consists of the following parts.

1. Fusing thermofuse
2. Hot roller
3. Fusing thermistor
4. Lower entrance guide
5. Pressure roller
6. Pressure lever
7. Cleaning roller
8. Pressure spring
9. Hot roller strippers
10. Fusing lamp

7.2 FUSING DRIVE AND RELEASE MECHANISM



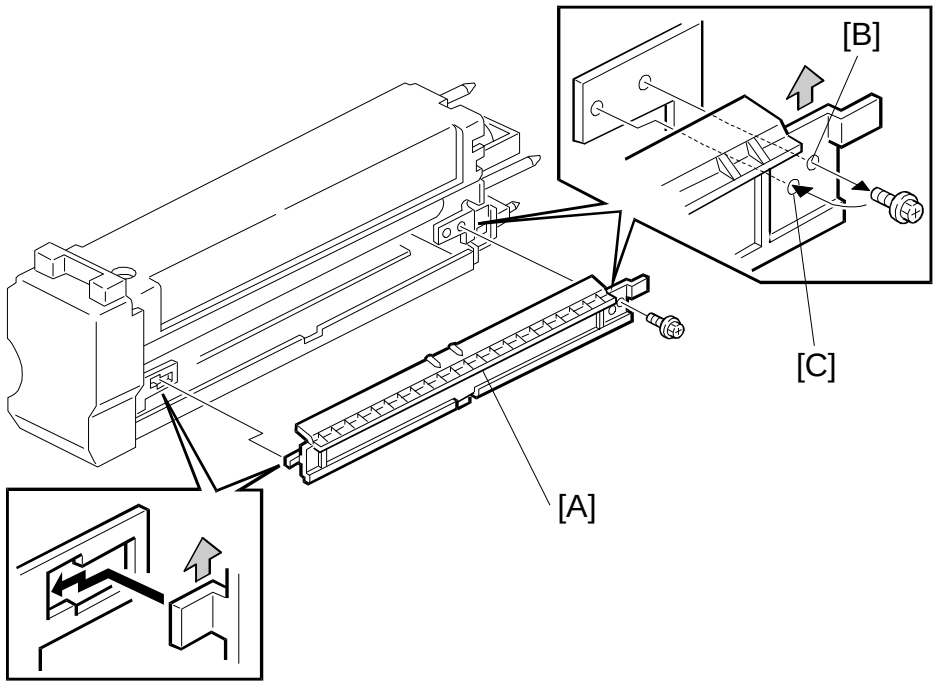
A193D036.wmf

The main motor [A] drives the fusing unit through a train of gears.

The fusing unit drive release mechanism automatically disengages the fusing unit drive gear [B] when the front cover [C] is opened. This allows the fusing unit drive gear to rotate freely so that misfed paper can be easily removed.

When the front cover is opened, the actuator plate [D] pulls release wire [E]. The wire pulls the fusing unit gear bracket [F] and the fusing unit drive is disengaged.

7.3 FUSING ENTRANCE GUIDE SHIFT MECHANISM



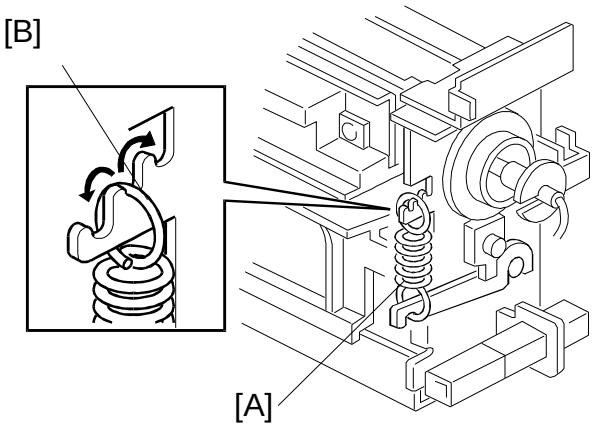
A193D539.wmf

The entrance guide [A] for this machine has two holes on the rear side of the entrance guide to adjust for thick or thin paper. Normally, the upper screw hole [B] is used.

For thin paper, move the entrance guide up by securing it with screw hole [C]. This slightly lengthens the paper path, which prevents the paper from creasing in the fusing unit.

For thick paper, move the entrance guide down (use the lower screw hole). This is because the lower setting allows more direct access to the gap between the hot and pressure rollers. This prevents thick paper from buckling against the hot roller, which can cause blurring at the leading edge of the copy. Also, thick paper does not bend as easily, and is therefore less prone to creasing.

7.4 PRESSURE ROLLER

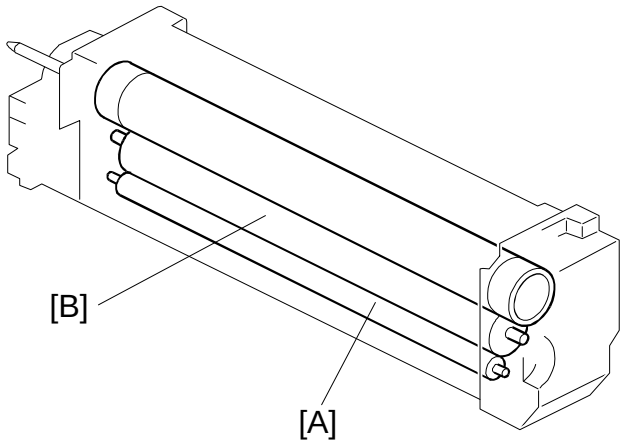


A193D035.wmf

The pressure roller is made of silicone rubber with teflon tube coating. The pressure spring [A] constantly applies pressure between the hot roller and the pressure roller.

The pressure roller can be changed by adjusting the position of the pressure springs. The middle position [B] is the normal setting. The upper position increases the pressure and this prevents insufficient fusing.

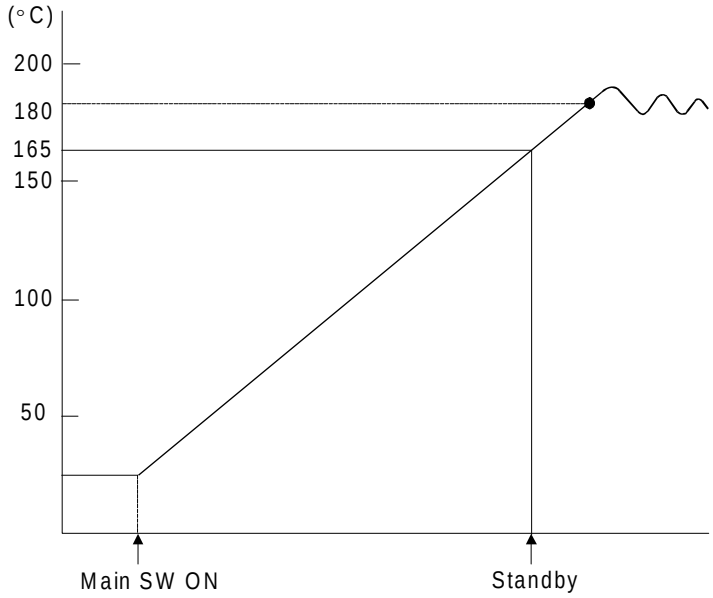
7.5 CLEANING MECHANISM



A193D537.wmf

The cleaning roller [A] is always in contact with the pressure roller [B]. It collects toner and paper dust adhering to the surface of the pressure roller. This is because the cleaning roller is made of metal and collects adhering matter more easily than the pressure roller (which has a teflon coating).

7.6 FUSING TEMPERATURE CONTROL



A193D525.wmf

When the main switch turns on, the CPU checks the ac frequency for 500 ms. Then the CPU turns on the fusing lamp. When the thermistor detects the stand-by temperature (165 °C), the machine can start to print. When the thermistor detects the operating fusing temperature (180 °C), the CPU maintains this temperature using phase control.

Phase control is the only type of fusing control in this machine.

7.7 OVERHEAT PROTECTION

If the hot roller temperature becomes greater than 230°C, the CPU cuts off the power to the fusing lamp. At this time, SC543 will be generated.

Even if the thermistor overheat protection fails, there is a thermofuse in series with the common ground line of the fusing lamp. If the temperature of the thermofuse reaches 169°C, the thermofuse opens, removing power from the fusing lamp. At this time, the copier stops operating.

8. ENERGY SAVER MODES

8.1 OVERVIEW

When the machine is not used, the energy saver function reduces power consumption by decreasing the fusing temperature.
This machine has three types of energy saver mode as shown below.

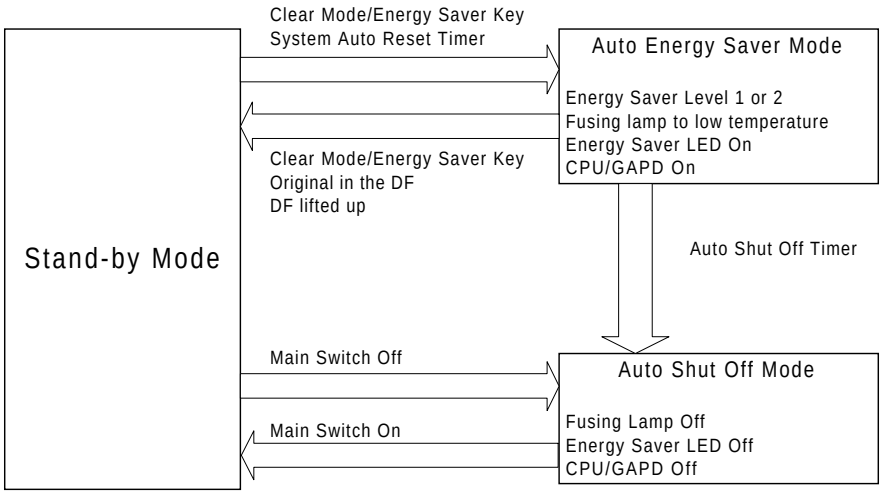
1. Auto Energy Saver Mode
2. Auto Shut Off Mode
3. Night Mode

These modes are controlled by the following UP modes.

- System Auto Reset Timer
- Auto Shut Off Timer
- Auto Energy Saver Mode Enable/Disable
- Auto Shut Off Mode Enable/Disable (SP mode only)

The way that the machine operates depends on the combination of installed equipment (copier only, copier/printer, copier/fax, copier/fax/printer)

8.2 COPIER ONLY



A193D547.wmf

Entering energy saver mode

The machine enters energy saver level 1 or 2 when one of the following is done.

- The system auto reset timer runs out.
- The Clear Mode/Energy Saver key is held down for over 1 s

What happens in energy saver modes 1 and 2

When the machine enters energy saver level 1 or 2, the fusing lamp drops to a certain temperature, depending on the energy saver level selected (UP mode).

The fusing temperature for energy saver level 1 is 15°C below the fusing lamp operating temperature, which is set by SP1-105-1 (default: 180 - 15 = 165°C). The fusing temperature for energy saver level 2 is the value set by SP1-105-2 (default: 140°C for 115V machines, room temperature for 230V machines).

When the auto shut off timer runs out

The auto shut off timer starts when the machine enters standby mode.

When this timer runs out, the machine enters auto shut off mode and the main switch turns off automatically. The fusing lamp and all dc supplies except +5VE turn off.

+5VE is the 5 volt supply for energy saver mode. It saves energy by supplying +5V power only for the components needed in energy saver mode.

Note that turning the main switch off is the same as entering auto shut off mode.

Returning to standby mode

- From energy saver level 1 or 2 -

If one of the following is done, the machine returns to standby mode:

- Pressing the Clear Mode/Energy Saver key
- Placing an original in the ADF
- Lifting up the ADF

The recovery time from energy saver level 1 is about 3 s.
The recovery time from energy saver level 2 is about 10 s (115 V machines) or about 35 s (230 V machines).

- From auto shut off mode -

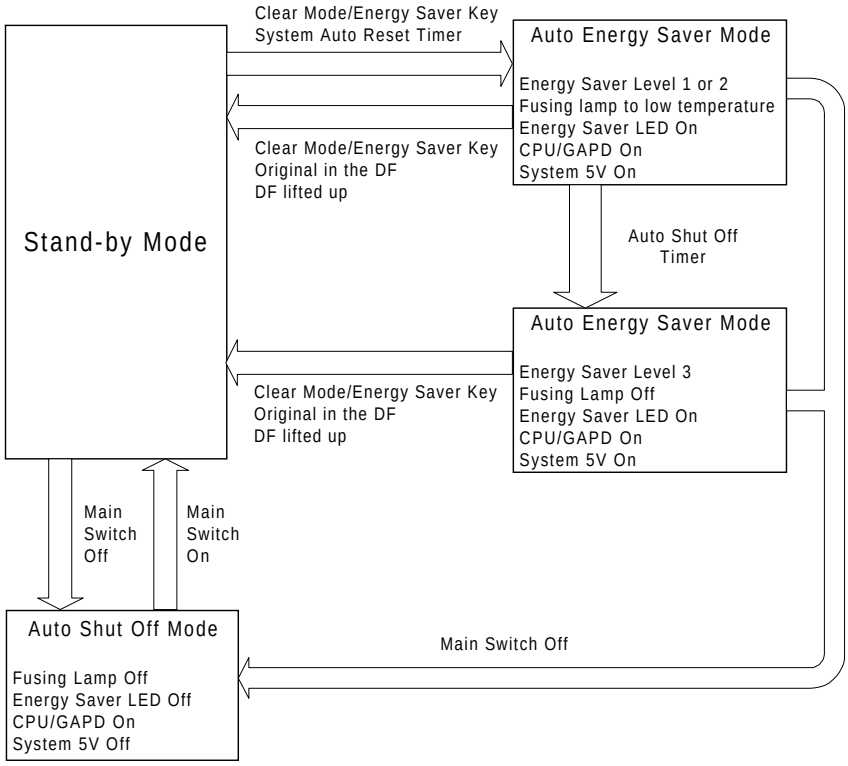
The machine returns to the ready condition when the main switch is turned on.

The recovery time is less than 30 s for 115V machines, and less than 35 s for 230V machines.

Power Consumption

Mode	Main Switch	Energy Saver LED	Fusing Lamp	System +5V	Note
Energy Saver Level 1	On	On	165°C	On	The machine returns to standby mode if the DF is lifted or an original is placed in the ADF.
Energy Saver Level 2	On	On	140°C (115V) Room T (230V)	On	
Auto Shut Off Mode	Off	Off	Off	Off	The machine returns to standby mode only if the main switch is turned on.

8.3 COPIER/PRINTER



A193D548.wmf

Entering energy saver mode

The machine enters energy saver level 1 or 2 in the same way as the copier only configuration.

What happens in energy saver modes 1 and 2

The behaviour of the machine in energy saver levels 1 and 2 is the same as in the copier only configuration (fusing lamp at low temperature).

However, when the auto shut off timer runs out, the machine enters energy saver mode level 3 instead of auto shut off mode.

What happens in energy saver level 3

When the machine enters energy saver level 3, the fusing lamp turns off completely. However, the system 5 volt supply stays on. The recovery time from this level is the same as for recovery from auto shut off mode. The machine will print incoming print jobs from a computer.

From energy saver level 3, the machine returns to standby mode in the same way as from energy saver levels 1 and 2.

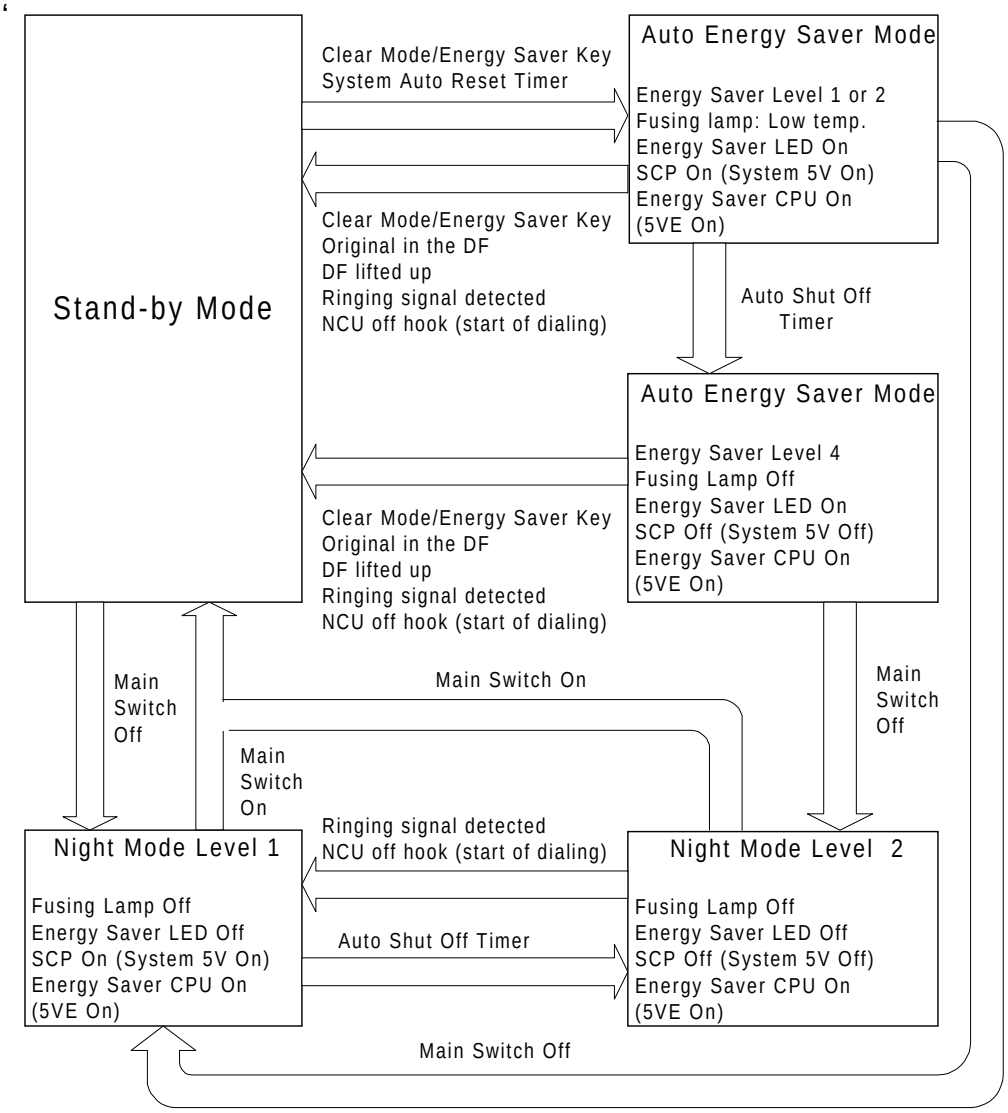
Entering auto shut off mode

The machine only enters auto shut off mode if the main switch is turned off. In this mode, the fusing lamp turns off and the machine will not print anything coming in from a computer.

Power Consumption

Mode	Main Switch	Energy Saver LED	Fusing Lamp	System +5V	Note
Energy Saver Level 1	On	On	165°C	On	The machine returns to standby mode if the DF is lifted or an original is placed in the ADF. Data from a PC is printed.
Energy Saver Level 2	On	On	140°C (115V) Room T (230V)	On	
Energy Saver Level 3	On	On	Off	On	
Auto Shut Off Mode	Off	Off	Off	Off	The machine returns to standby mode only if the main switch is turned on. Data from a PC is not printed.

8.4 COPIER/FAX, COPIER/PRINTER/FAX



A193D549.wmf

Energy saver mode is more complex in this configuration. This is because there are two night modes, instead of the auto shut off mode. Night mode level 2 is similar to auto shut off mode. Night mode level 1 keeps the machine in a slightly higher state of readiness (the main cpu is active and the system 5 volt supply is on, but the fusing lamp is still off).

Entering energy saver mode

The machine enters energy saver level 1 or 2 in the same way as the copier only and copier/printer configurations.

What happens in energy saver modes 1 and 2

The behaviour in these levels is the same also (fusing lamp at low temperature). However, there are two extra cases for leaving energy saver mode:

- Ringing signal detected
- NCU off-hook (the machine starts to dial a fax number)

If the auto shut off timer runs out while the main switch is still on, the machine enters energy saver level 4.

What happens in energy saver mode 4

In this mode, the fusing lamp switches off. Also, the system +5V supply switches off. Only the +5VE supply stays on, so that the machine can monitor the ADF, the telephone line, and the operation panel.

The machine recovers to standby mode in the same conditions as for level 1 or 2. For example, incoming faxes and printer jobs will be printed. The recovery time from this level is the same as for recovery from auto shut off mode.

Entering night mode

If the main switch is turned off while the machine is in standby or energy saver mode 1 or 2, the machine enters night mode 1.

If the main switch is turned off while the machine is energy saver mode 4, the machine enters night mode 2.

- Night mode 1 -

The fusing lamp turns off. However, the system +5V is still supplied to all components. When the machine detects a ringing signal, the machine automatically prints the incoming message.

From night mode level 1, the machine goes to night mode level 2 when the auto shut off timer runs out.

- Night mode 2 -

The system +5V supply also turns off. However, +5VE (+5V for the energy saver) is still activated. If the machine detects a ringing signal or off-hook signal, the machine goes back to night mode level 1. At this time, the system +5V supply is activated. Then the machine receives the incoming message and prints it.

The machine leaves night mode and returns to standby mode if the main switch is turned on.

Power Consumption

Mode	Main Switch	Energy Saver LED	Fusing Lamp	System +5V	Note
Energy Saver Level 1	On	On	165°C	On	The machine returns to standby mode if the DF is lifted or an original is placed in the ADF. Incoming faxes and data from a PC are printed.
Energy Saver Level 2	On	On	140°C (115V) Room T (230V)	On	
Energy Saver Level 4	On	On	Off	On	
Night Mode Level 1	Off	Off	Off	On	Incoming faxes are printed, and faxes can be sent. However, PC data is not printed. For copying, the machine returns to standby mode only if the main switch is turned on.
Night Mode Level 2	Off	Off	Off	Off	If an incoming call (ringing signal) is detected, or if the user tries to send a fax, the machine goes into Night Mode Level 1. PC data is not printed. For copying, the machine returns to standby mode only if the main switch is turned on.

8.5 ENERGY SAVER CONTROL

The block diagram on the next page shows the relationship between the power supply signals and the command signals for energy saver mode.

There are two CPUs for energy saver mode. One is the CPU/GAPD (Gate Array Power Drive) on the BICU board and the other is the Energy Saver CPU on the FCU board.

The +5VE supply is for energy saver mode, and it is always supplied to the machine. The +5V supply is shut down in some energy saver modes.

Copier configuration

When either the Clear Modes/Energy Saver Mode key is pressed or the system auto reset timer runs out, the GAPD turns on the Energy Saver LED and requests the main CPU to reduce the fusing temperature.

When the auto shut off timer runs out, the GAPD turns off the main switch using the SW_TRG signal. Then IC 11 on the BICU board sends a signal to the PSU, and the PSU shuts down the +5V, +12V, -12V, and +24V supplies and cuts the ac power for the fusing lamp.

Copier/printer configuration

The GAPD controls the energy saver function, as in the copier configuration. When the auto shut off timer runs out, the GAPD keeps the Energy Saver LED on but requests the main CPU to cut the fusing lamp power.

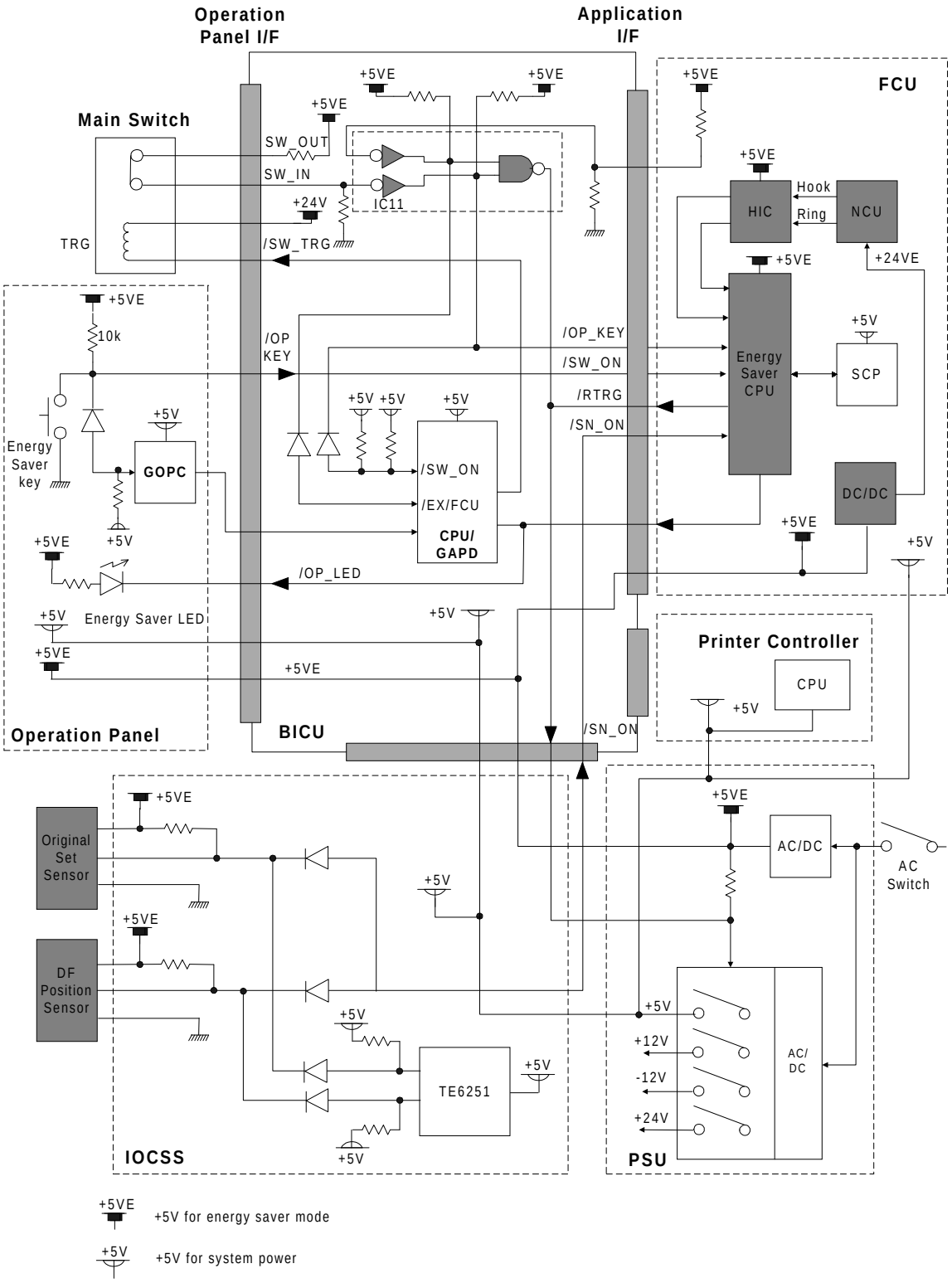
When the main switch has been turned off manually, the CPU requests the PSU to shut down the +5V, +12V, -12V, and +24V supplies.

Fax configurations (Copier/fax and Copier/fax/printer)

The Energy Saver CPU monitors the Clear Modes/Energy Saver Mode key, and controls the Energy Saver LED. When either the Clear Modes/Energy Saver Mode key is pressed or the system auto reset timer runs out, the Energy Saver CPU turns the Energy Saver LED on and requests the copier main CPU to reduce the fusing temperature. When the auto shut off timer runs out, the Energy Saver CPU keeps on the Energy Saver LED, but requests the copier main CPU to cut the fusing lamp power. Then the CPU instructs the PSU to shut down the +5V, +12V, -12V, and +24V supplies.

When the main switch has been turned off manually (night mode), the Energy Saver CPU turns off the Energy Saver LED, and the fusing lamp goes off. When the CPU detects one of the energy saver recovery conditions, it requests the PSU to supply all dc supplies using the /RTRG signal.

- Block Diagram -

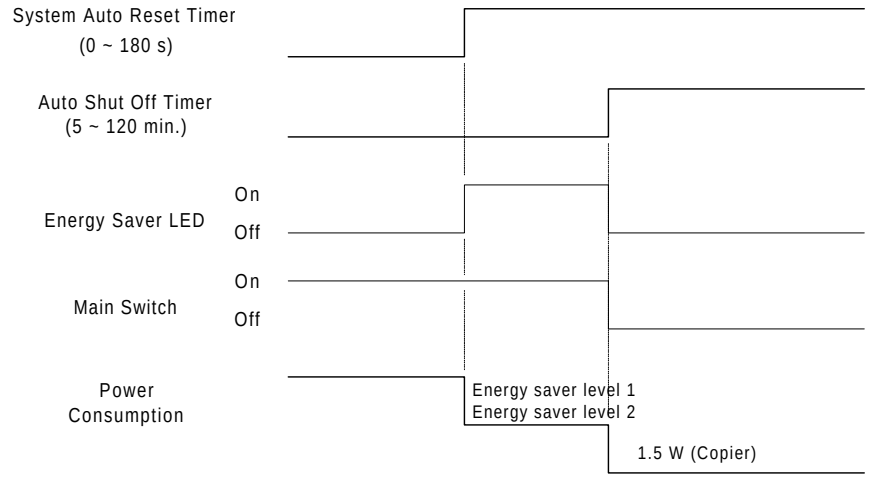


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8.6 ENERGY SAVER TIMING CHARTS

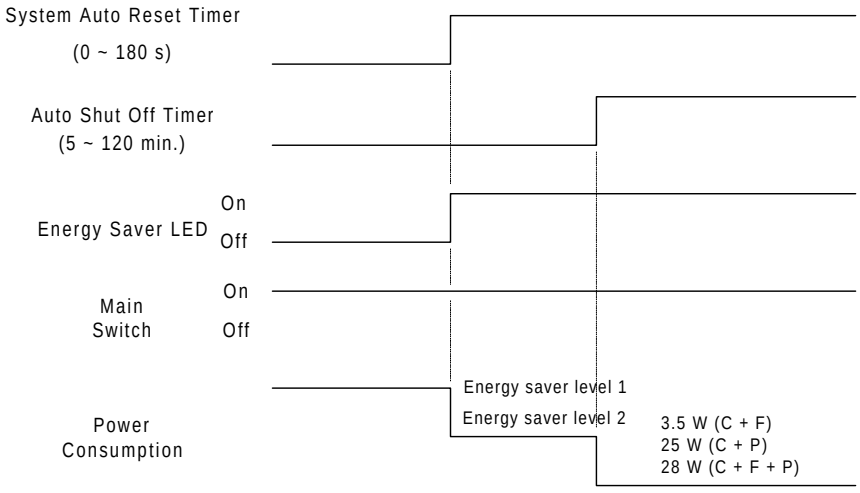
1. Auto Energy Saver mode: On Auto Shut Off mode: On

- Copier Configuration -



A193D532.wmf

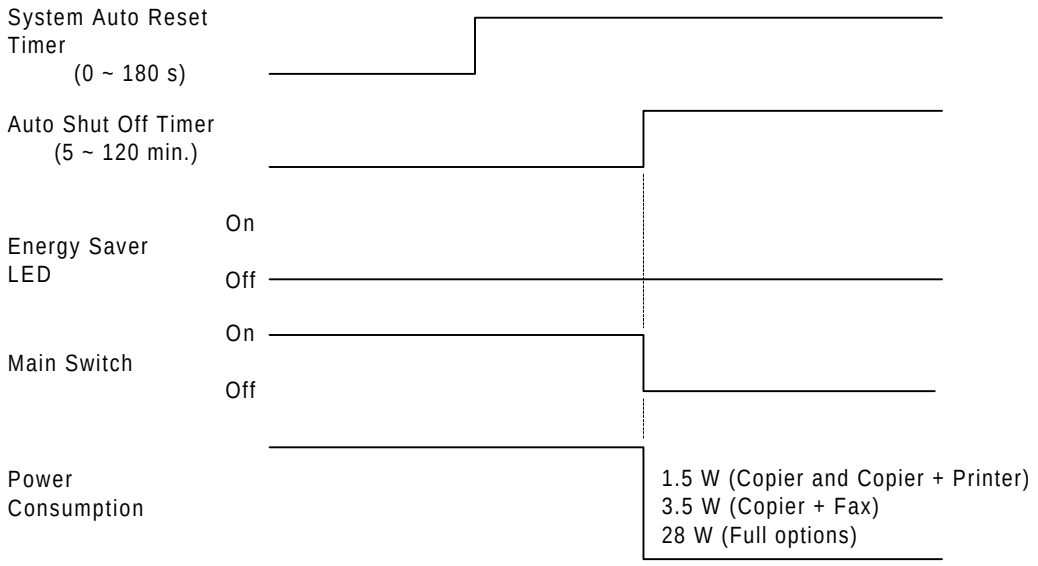
- Copier + Fax and Copier + Fax + Printer Configurations -



A193D515.wmf

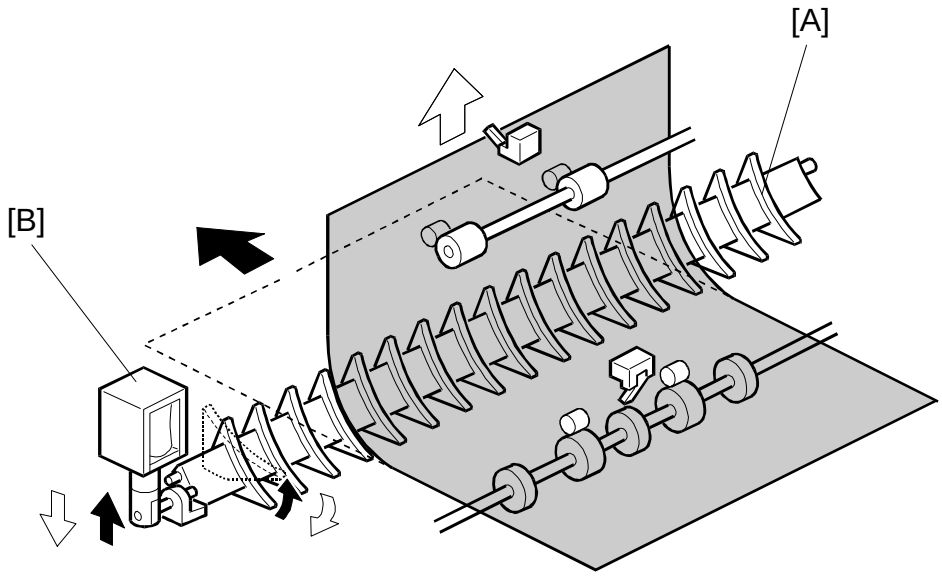
2. Auto Energy Saver mode: Off Auto Shut Off mode: On

- All configurations -



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9. PAPER EXIT



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The copy from the fusing unit goes either upwards to deliver the copy paper to the face down tray, or straight through to the face up tray, depending on the junction gate [A].

The junction gate solenoid [B] operates the junction gate. Usually, the junction gate is off and the copy goes up to the face down copy tray. When the junction gate solenoid is energized, the junction gate is opened. Then the copy goes through to the face up copy tray.

SECTION 3

INSTALLATION

1. INSTALLATION REQUIREMENTS

1.1 ENVIRONMENT

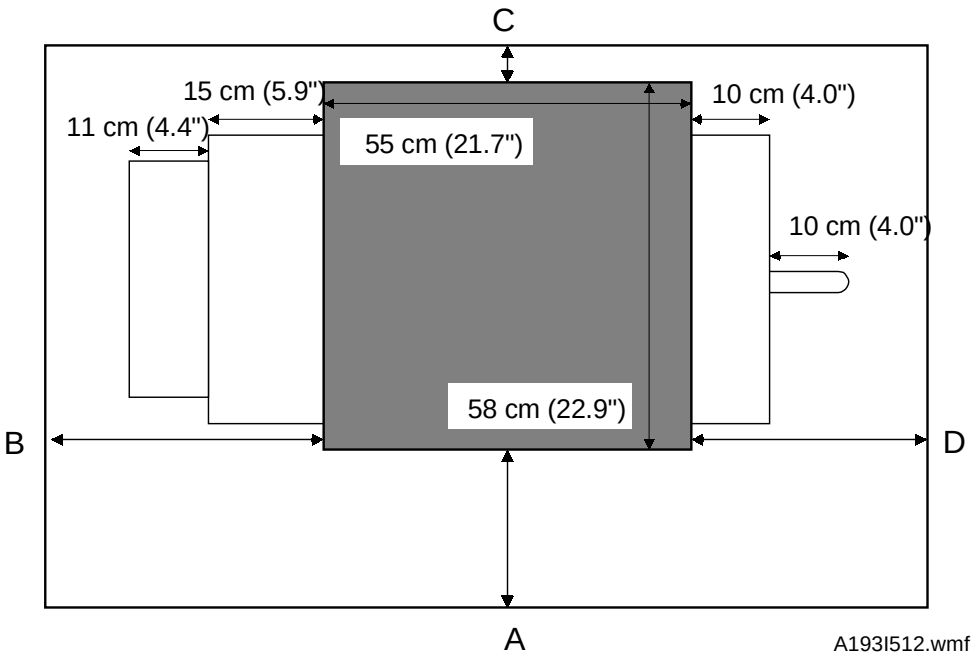
1. Temperature Range: 10 °C to 30 °C (50 °F to 86 °F)
2. Humidity Range: 15 % to 90 % RH
3. Ambient Illumination: Less than 1,500 lux (Do not expose to direct sunlight.)
4. Ventilation: Room air should turn over at least 30 m^3/hr/person
5. Ambient Dust: Less than 0.10 mg/m^3 (2.7 x 10^{-6} oz/yd^3)
6. Avoid an area which is exposed to sudden temperature changes. This includes:
   1) Where it will not be directly exposed to cool air from an air conditioner.
   2) Where it will not be directly exposed to reflected heat from a heater.
7. Do not place the machine in an area where it will be exposed to corrosive gasses.
8. Do not install the machine at any location over 2,000 m (6,500 ft.) above sea level.
9. Place the copier on a strong and level base. (Inclination on any side should be no more than 5 mm.)
10. Do not place the machine where it may be subjected to strong vibrations.

1.2 MACHINE LEVEL

1. Front to back: Within 5 mm (0.2") of level
2. Right to left: Within 5 mm (0.2") of level

1.3 MINIMUM SPACE REQUIREMENTS

Place the copier near the power source, providing clearance as shown:



A: In front: Over 75 cm (29.6")
B: Left: Over 34 cm (13.4")
C: To rear: Over 1 cm (0.4")
D: Right: Over 31 cm (12.2")

NOTE: The 75 cm recommended for the front space is for pulling out the paper tray only. If an operator stands at the front of the copier, more space is required.

1.4 POWER REQUIREMENTS

⚠ CAUTION

1. Make sure that the wall outlet is near the copier and easily accessible. Make sure the plug is firmly inserted in the outlet.
2. Avoid multi-wiring.
3. Be sure to ground the machine.

1. Input voltage level: 120 V, 60 Hz: More than 10 A
   220 V ~ 240 V, 50 Hz/60 Hz: More than 6 A
2. Permissible voltage fluctuation: 10 %
3. Do not set anything on the power cord.

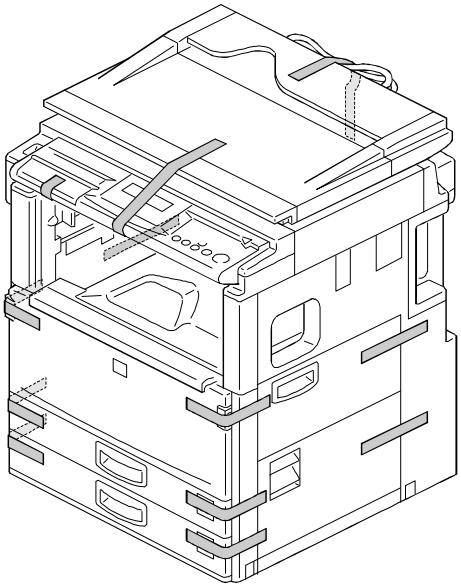
2. COPIER INSTALLATION

2.1 ACCESSORY CHECK

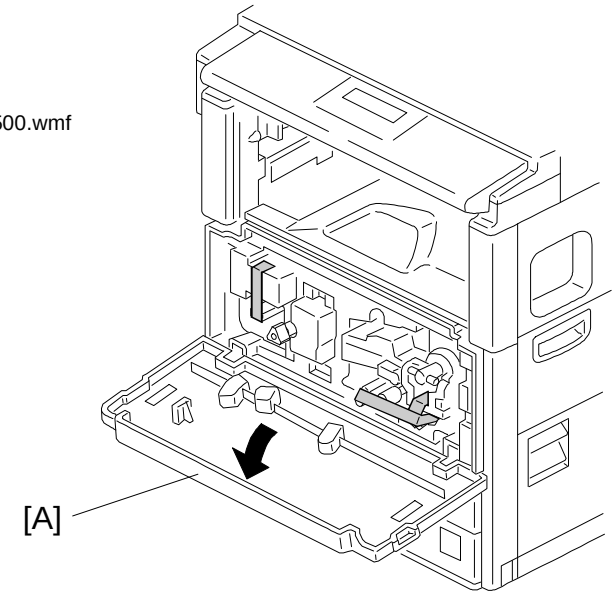
Check the quantity and condition of the accessories in the box against the following list:

No.	Description	Q'ty
1	Operating Instructions	2
2	User Survey Card (-17 machine only)	1
3	NECR	1

2.2 COPIER INSTALLATION PROCEDURE



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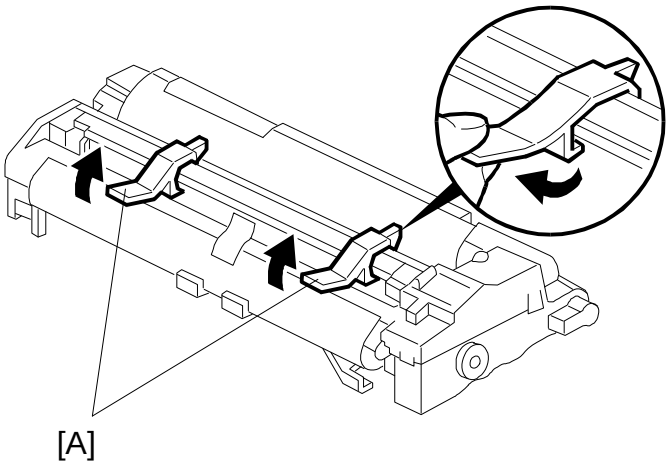


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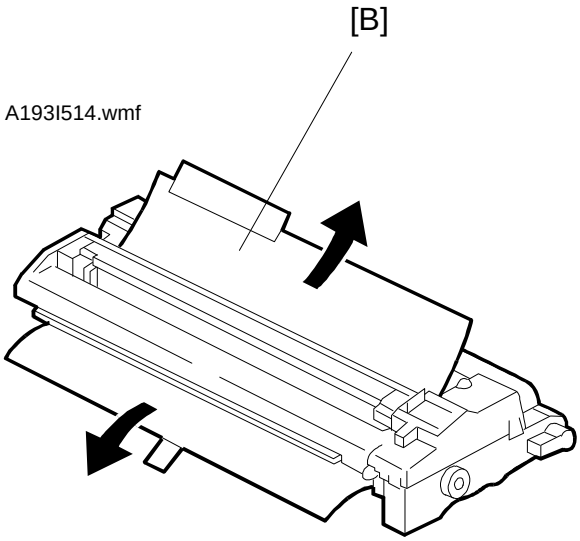
⚠ CAUTION

Unplug the copier power cord before starting the following procedure.

1. Remove the tapes on the exterior of the copier.
2. Open the front cover [A].
3. Remove the tapes inside the copier.



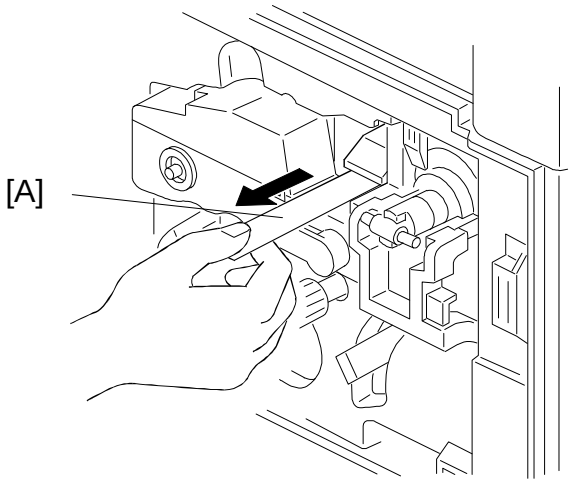
A193I514.wmf



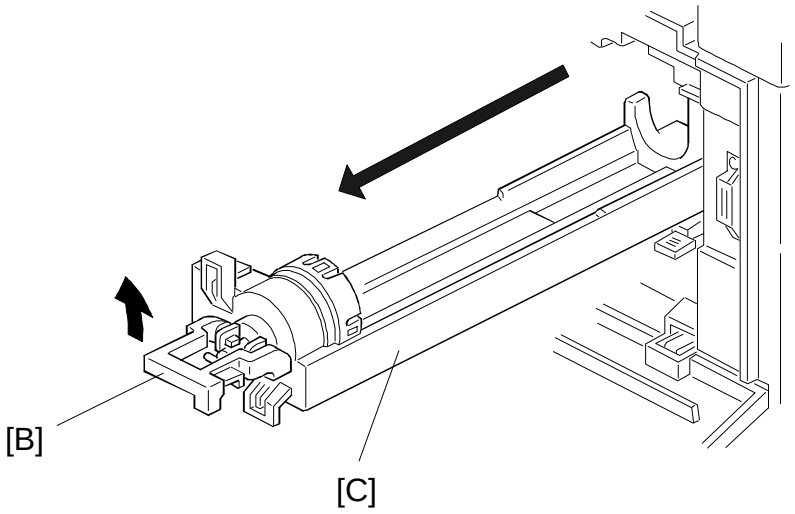
A193I515.wmf

4. Unpack the new PCU.
5. Remove 2 clamps [A] and drum protection sheet [B] from the new PCU.

   NOTE: Do not touch the photoconductor. If you do, copy quality may be abnormal.
6. Insert the new PCU into the machine. Push the new PCU in until the release lever locks.



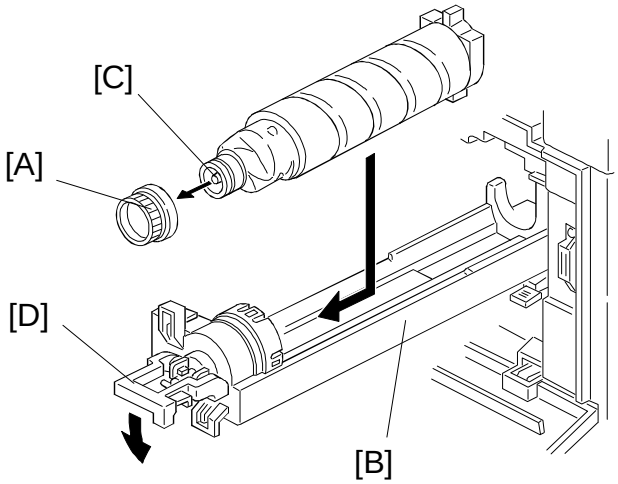
A193I502.wmf



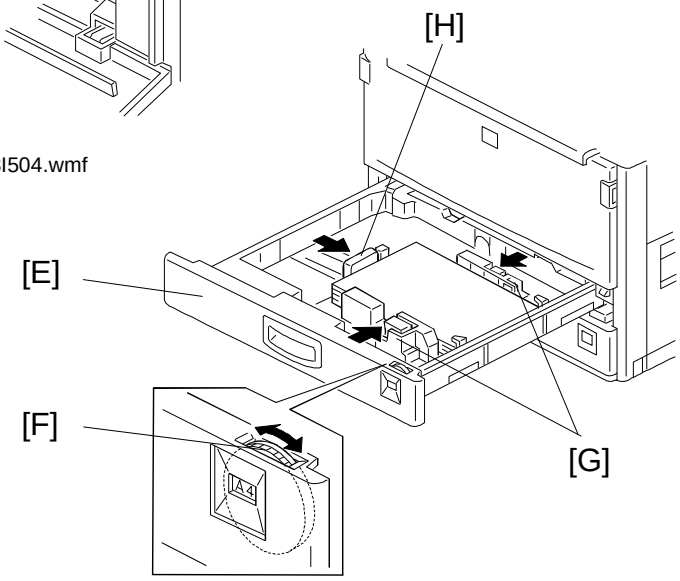
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7. Peel the sealing tape [A] off the development unit to install the developer.
8. Raise the toner bottle holder lever [B] and pull the toner bottle holder [C] out.
9. Shake the toner bottle well.

   NOTE: Do not remove the bottle cap of the toner bottle at this time.



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A193I505.wmf

10. Unscrew the bottle cap [A] and insert the bottle into the holder [B].

    NOTE: Do not open the inner bottle cap [C].

11. Reposition the holder and press down the holder lever [D] to secure the bottle.

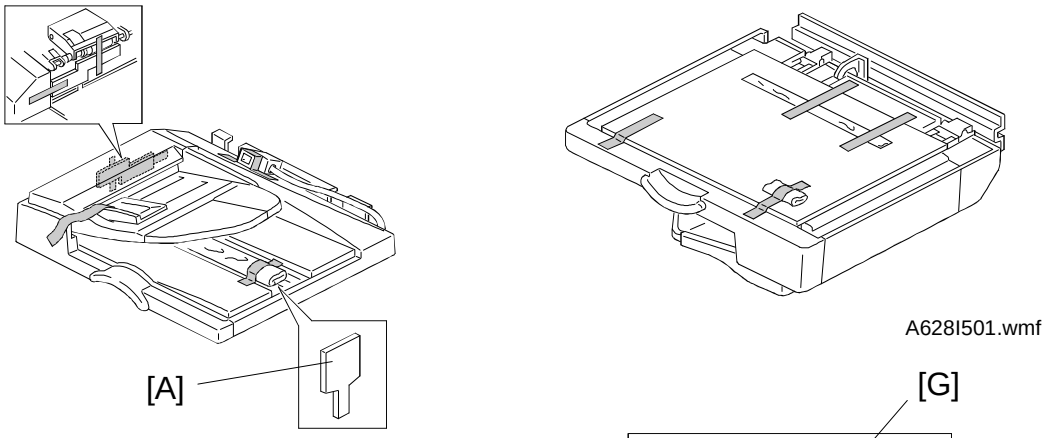
12. Install the optional platen cover if required:
    1) Install two stud screws on the top cover.
    2) Position the platen cover bracket on the stud screws and slide it to the left.

13. Pull the paper tray [E] out and turn the paper size dial [F] to select the appropriate size. Adjust the side guides [G] and end guide [H] to match the paper size.

14. Turn the ac and main switches on. The machine automatically performs TD sensor initial setting. Then, check the copy quality and copying functions.

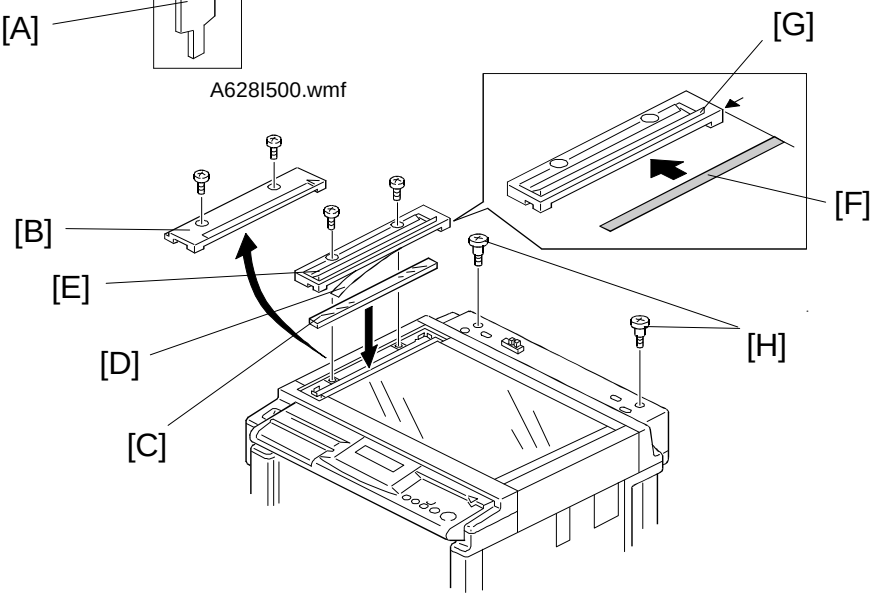
    NOTE: Do not turn the ac and main switches off or open any covers during the TD sensor initial setting.

2.3 AUTO DOCUMENT FEEDER INSTALLATION



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A628I502.wmf

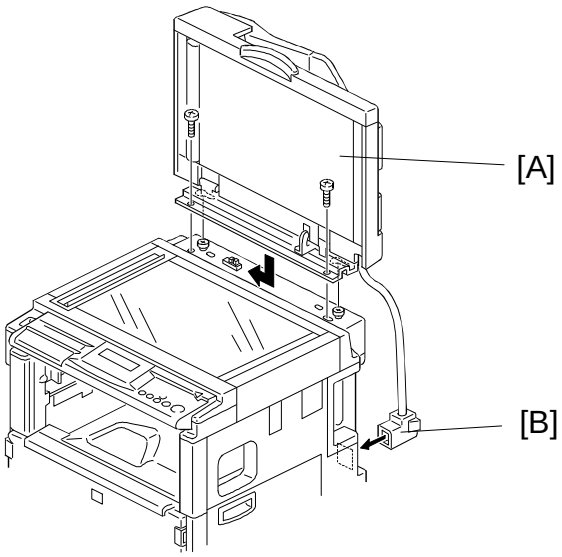
⚠ CAUTION

Unplug the copier power cord before starting the following procedure.

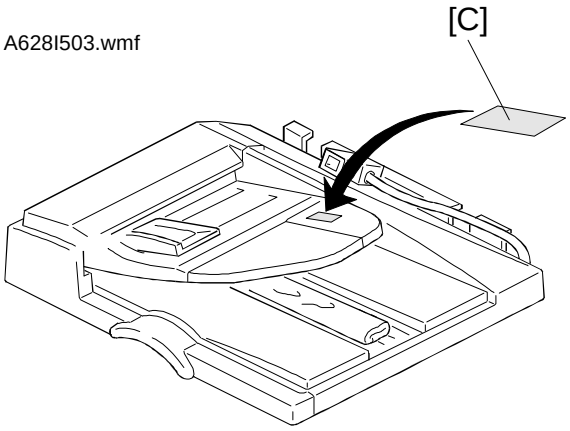
NOTE: When installing the DF, use the tool [A] in the accessory bag or a usual screw driver.

1. Unplug the document feeder. Then, remove all tapes.
2. Remove the left scale [B] (2 screws).
3. Place the DF exposure glass [C] on the glass holder.
4. Peel off the backing [D] of the double side tape attached to the rear side of the scale guide [E], then install the scale guide (2 screws removed in step 2).
5. Attach the original size decal [F] to the scale guide.

   NOTE: Place the decal at the rear edge, and the left side flush with the scale paper guide [G], as shown.
6. Install the stud screws [H] for the DF on the copier.



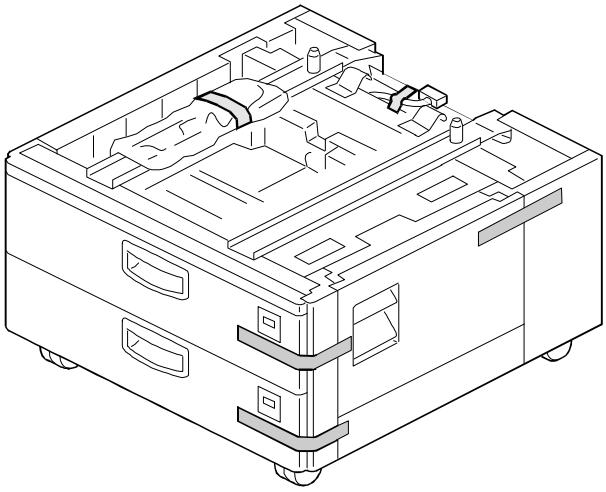
A628I503.wmf



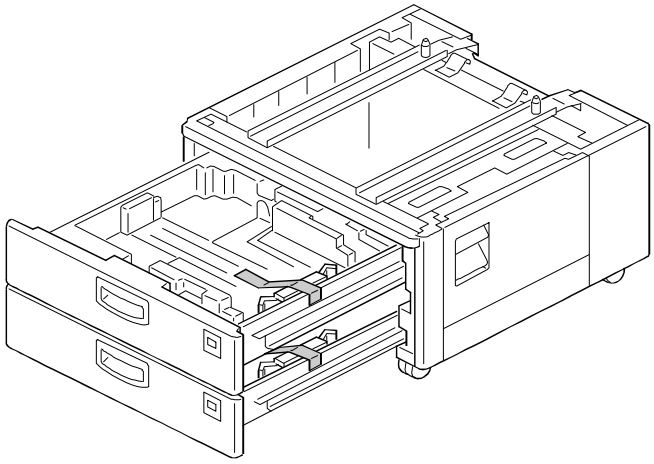
A628I505.wmf

7. Install the DF unit [A].
8. Slide the DF to the left, then secure the DF unit with 2 screws (M4 x 10).
9. Connect the I/F harness [B] to the copier.
10. Attach the original direction decal [C] to the DF table as shown.
11. Turn the ac and main switches on. Then, check if the document feeder works properly.

2.4 PAPER TRAY UNIT INSTALLATION



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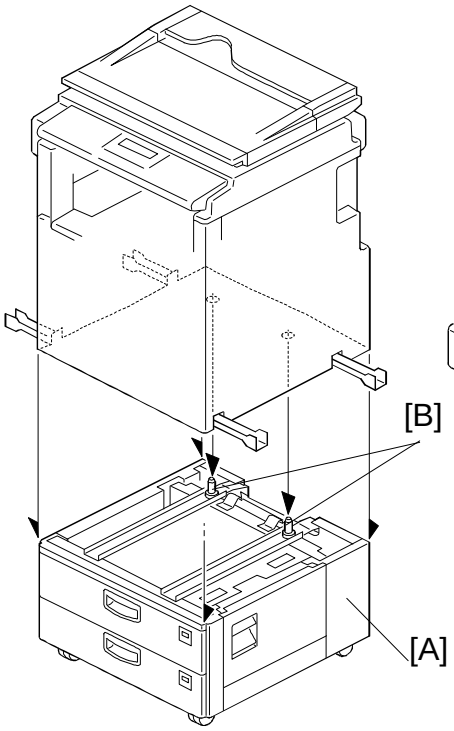


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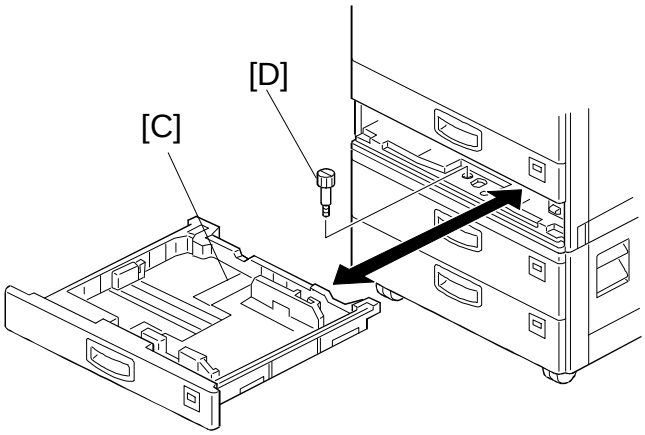
⚠ CAUTION

Unplug the copier power cord before starting the following procedure.

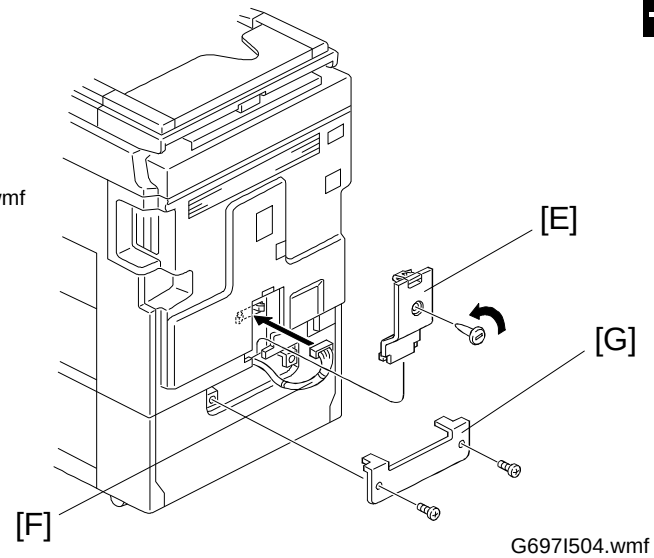
1. Unpack the paper tray unit. Then, remove the tapes (7 tapes).



G697I502.wmf



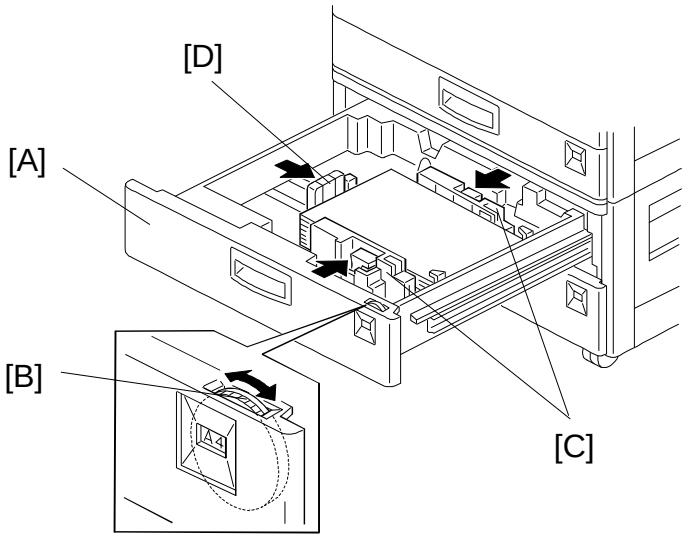
G697I503.wmf



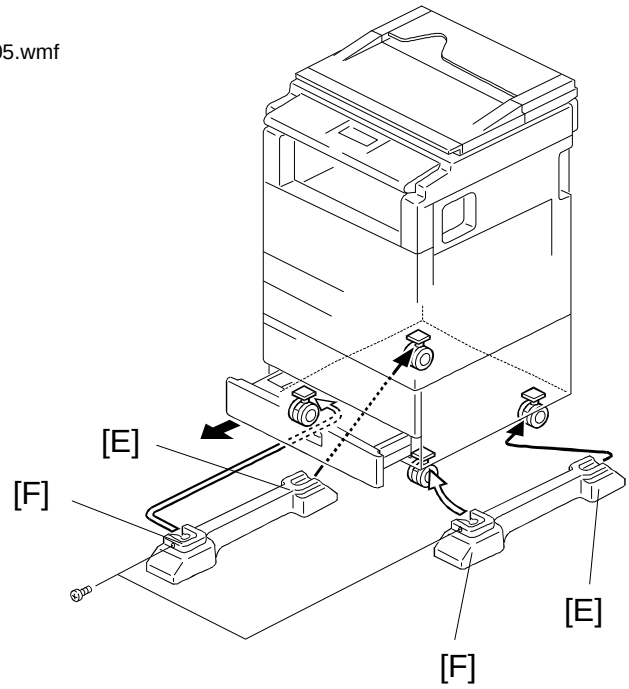
G697I504.wmf

2. Place the copier on the paper tray unit [A] with the pegs [B] fitting into the copier's peg holes.
3. Remove the copier's second paper tray [C].
4. Secure the knob screw [D].
5. Push the copier's second paper tray back into the copier.
6. Remove the connector cover [E].
7. Connect the paper feed unit harness [F] to the copier.
8. Reinstall the connector cover.
9. Secure the joint bracket [G] to the copier (2 screws).

   NOTE: Do not pinch the harness.



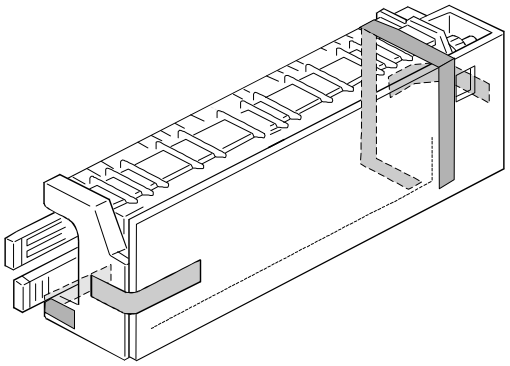
G697I505.wmf



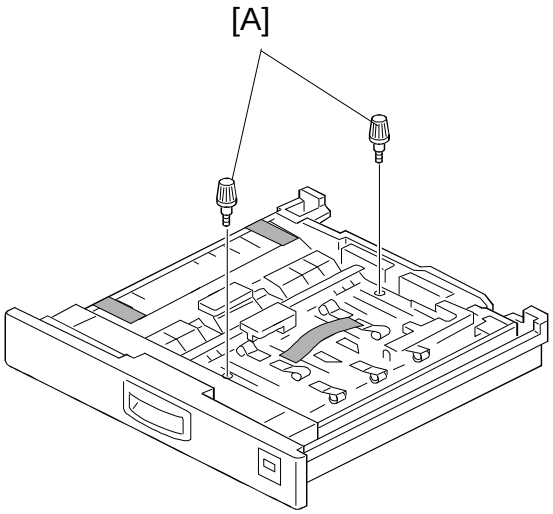
G697I506.wmf

10. Pull out the paper tray [A] and turn the paper size dial [B] to select the appropriate size. Then, adjust the side guides [C] and end guide [D] to match the paper size.
11. Turn the ac and main switches on. Then, check if the paper tray unit works properly.
12. Install the rear hooks of the stands [E] until they snap into place (1 screw).
13. Install the front hooks of the stands [F] until they snap into place (1 screw).

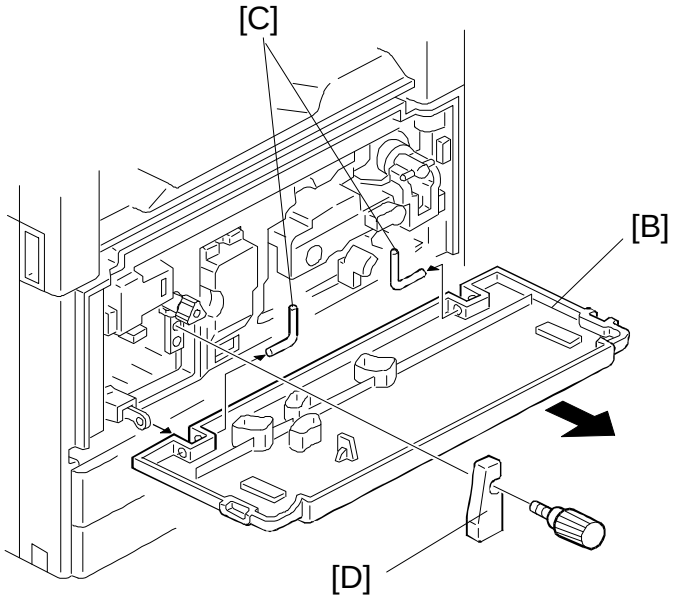
2.5 DUPLEX UNIT INSTALLATION



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G694I508.wmf

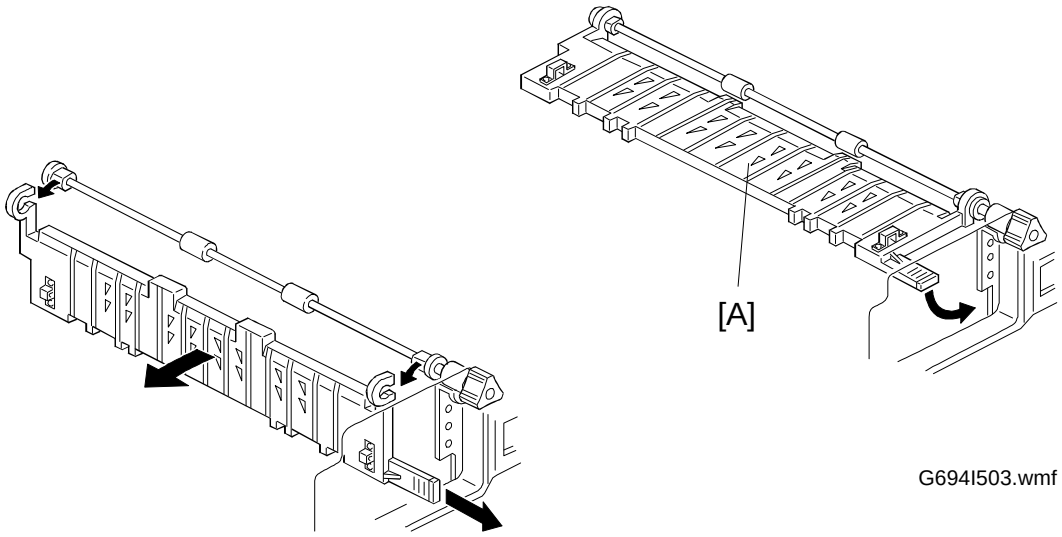


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⚠ CAUTION

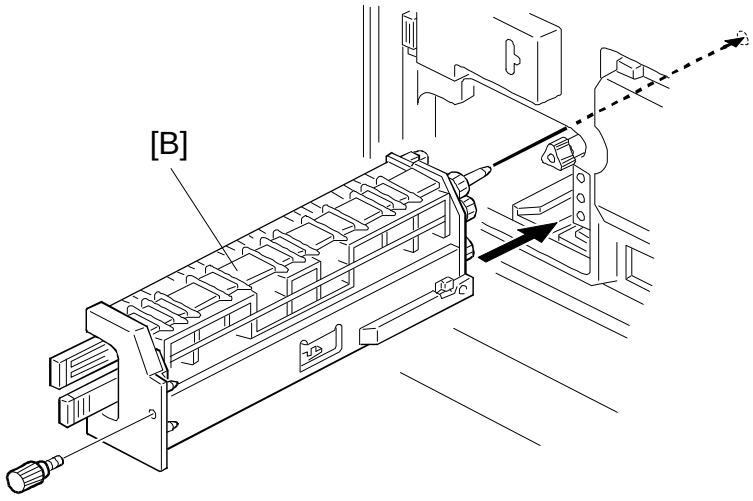
Unplug the copier power cord before starting the following procedure.

1. Unpack the inverter unit and duplex unit and remove the tapes (7 tapes) and two knob screws [A].
2. Open the front cover [B].
3. Slide the two hinges [C] inward and remove them as shown in the illustration. Then, remove the front cover.
4. Remove the inverter unit cover [D] (1 screw).



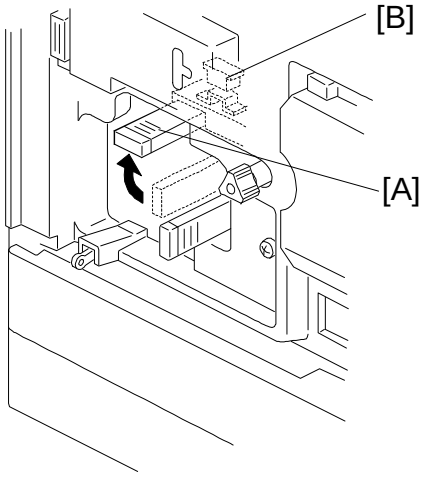
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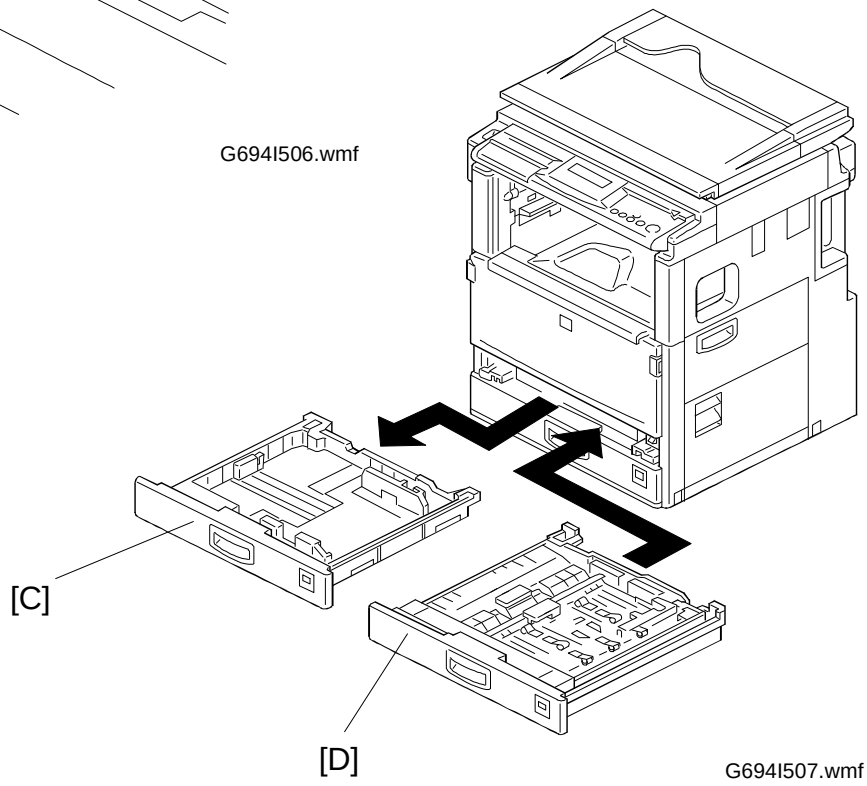


G694I505.wmf

5. Swing the lower transport guide plate [A] down as shown in the illustration.
6. Remove the lower transport guide plate and pull it out as shown in the illustration.
7. Push the inverter unit [B] in until the pin is completely inserted in the pin hole.
8. Secure the inverter unit with the screw which was removed in step 4.



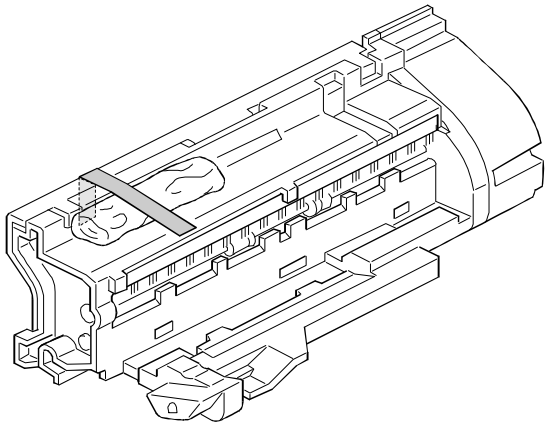
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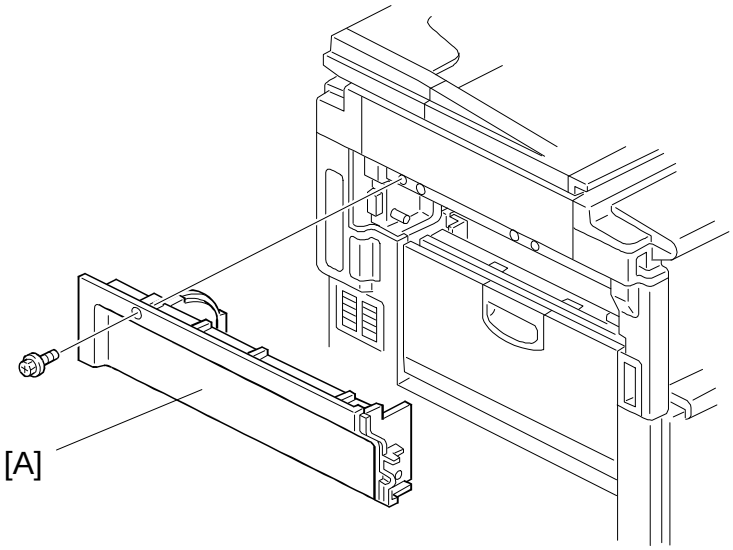
G694I507.wmf

9. Swing the upper inverter guide plate [A] up as shown in the illustration and secure it with the magnets [B] at front and rear.
10. Reinstall the front cover.
11. Pull out the 1st paper tray [C].
12. Push the duplex unit [D] into the place where the 1st paper tray was.
13. Turn the ac and main switches on and check if the duplex unit works properly.

2.6 1-BIN SORTER INSTALLATION



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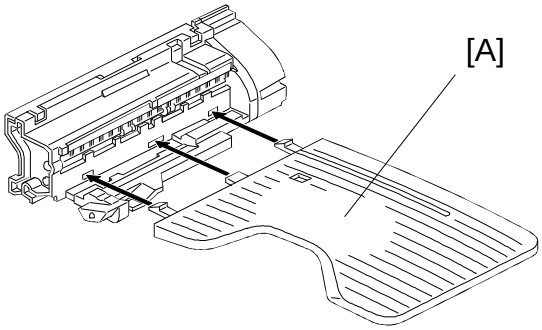


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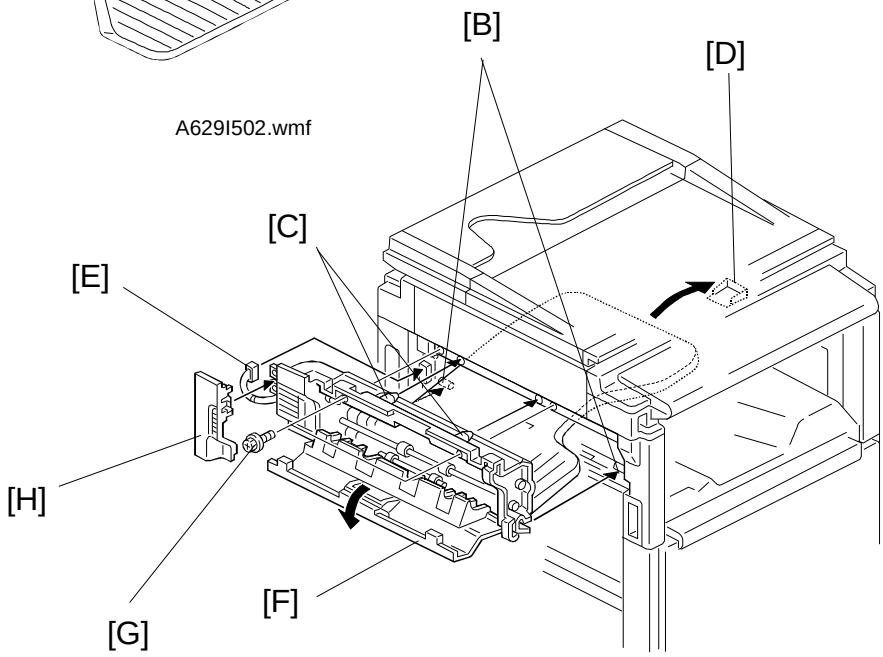
⚠ CAUTION

Unplug the copier power cord before starting the following procedure.

1. Unpack the copy tray and remove the tape.
2. Remove the left upper cover [A] (1 screw).



A629I502.wmf



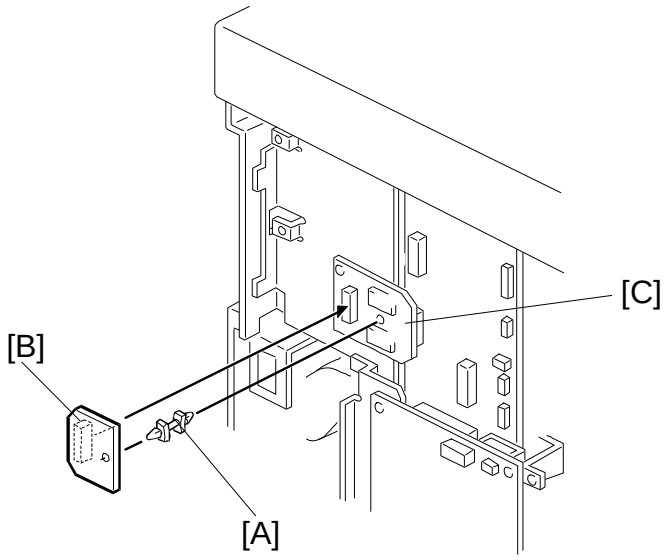
A629I503.wmf

3. Insert the hooks on the 1-bin sorter tray into the slots in the sorter unit [A].
4. Hook the clips on the 1-bin sorter unit onto the stud pins [B] on the copier.
5. Insert the pins [C] into the pin holes in the copier. Make sure to rest the 1-bin sorter tray on the tray support [D].

   NOTE: Do not pinch the I/F harness [E].
6. Open the left cover [F] and secure the unit (2 screws [G]).

   NOTE: Use the screw which was removed in step 2 and the other screw which is packed.
7. Couple the I/F cable connector with the copier.
8. Install the connector cover [H].
9. Turn the ac and main switches on and check if copies are delivered to the 1-bin sorter properly.

2.7 MEMORY BOARD



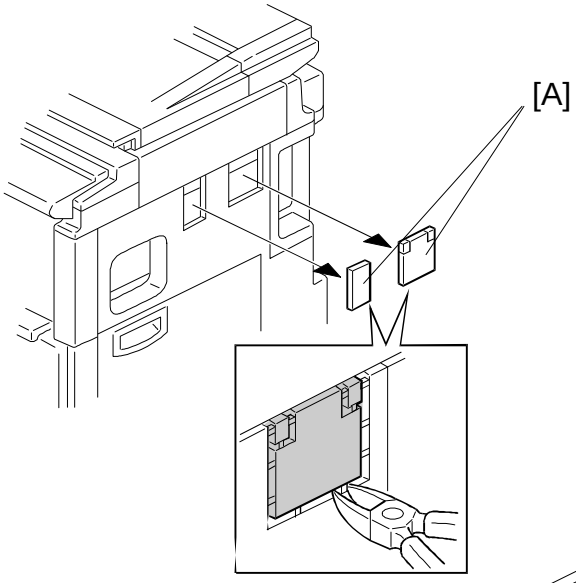
A193I041.wmf

⚠ CAUTION

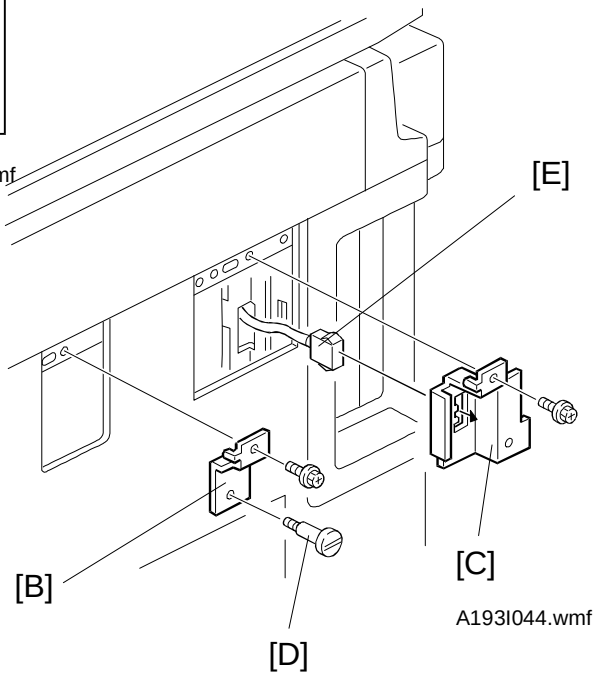
Unplug the copier power cord before starting the following procedure.

1. Remove the rear cover. (See Rear Cover Removal in Section 6.)
2. Install the spacer [A].
3. Install the memory board [B] on the MSU board [C].
4. Reassemble the machine.

2.8 KEY COUNTER HOLDER INSTALLATION

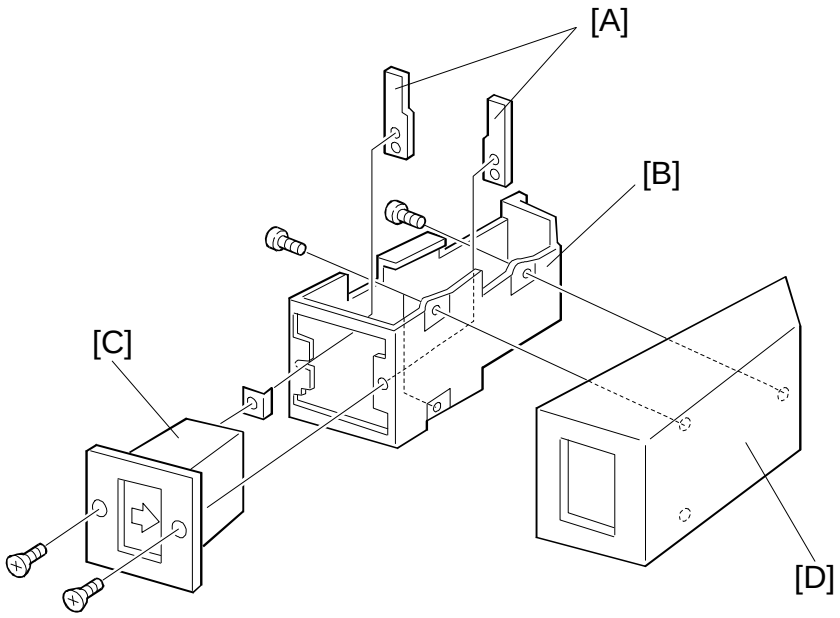


A193I043.wmf

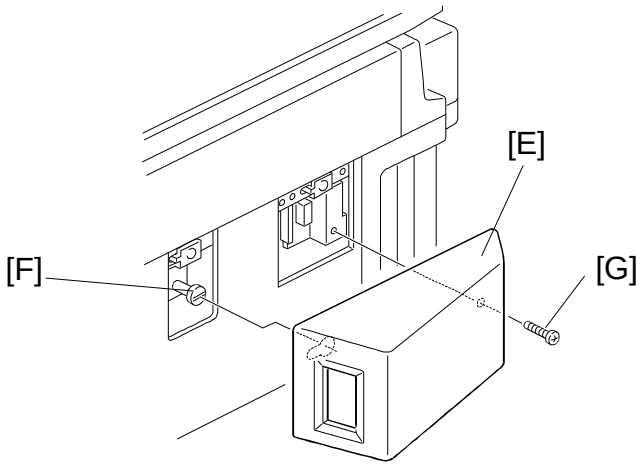


A193I044.wmf

1. Remove the caps [A].
2. Secure the front key counter bracket [B] (1 screw).
3. Secure the rear key counter bracket [C] (1 screw).
4. Install the stepped screw [D] into the front key counter bracket.
5. Plug the connector [E] into the rear key counter bracket.



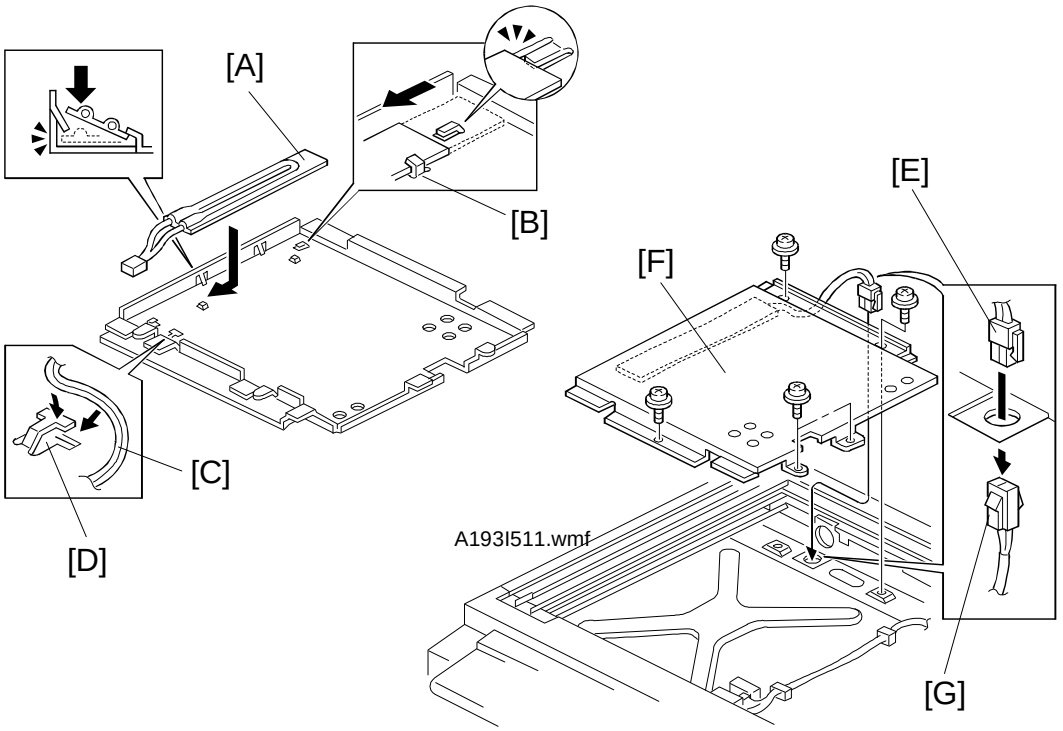
A193I506.wmf



A193I045.wmf

6. Hold the key counter plate nuts [A] on the inside of the key counter bracket [B] and insert the key counter holder [C].
7. Secure the key counter holder to the bracket (2 screws).
8. Install the key counter cover [D] (2 screws).
9. Connect the connector of the key counter holder.
10. Hook the key counter holder assembly [E] onto the stepped screw [F].
11. Secure the key counter holder assembly with a screw [G].

2.9 ANTI-CONDENSATION HEATER INSTALLATION



A193I510.wmf

⚠ CAUTION

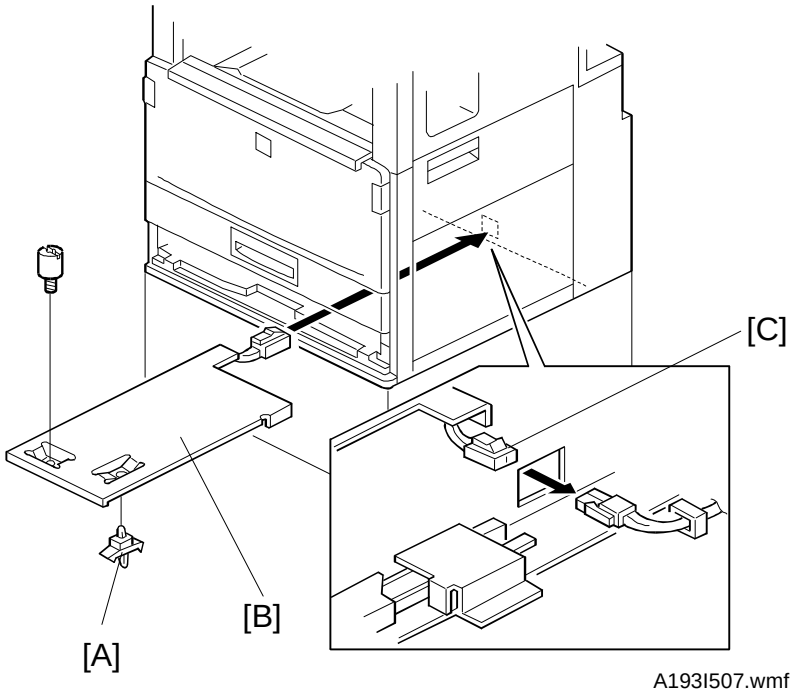
Unplug the copier power cord before starting the following procedure.

1. Remove the rear cover and lens cover. (See Rear Cover Removal and Lens Cover Removal in Section 6.)
2. Hook both ends of the heater [A] onto the clips [B].
3. Push the heater into the two clips.
4. Slide the heater to the left until it clicks into place. Fit the harness [C] into the clip [D].

   NOTE: Leave the clip out to prevent the heater from slipping off.
5. Insert the connector [E] into the hole.
6. Secure the inner cover [F].
7. Couple the connector coming down from the hole with another connector [G] coming up from the printer.

   NOTE: Tell the customer that even when the copier's main switch is turned off, the copier power cord should be plugged in. Otherwise, the heater will not function.

2.10 TRAY HEATER



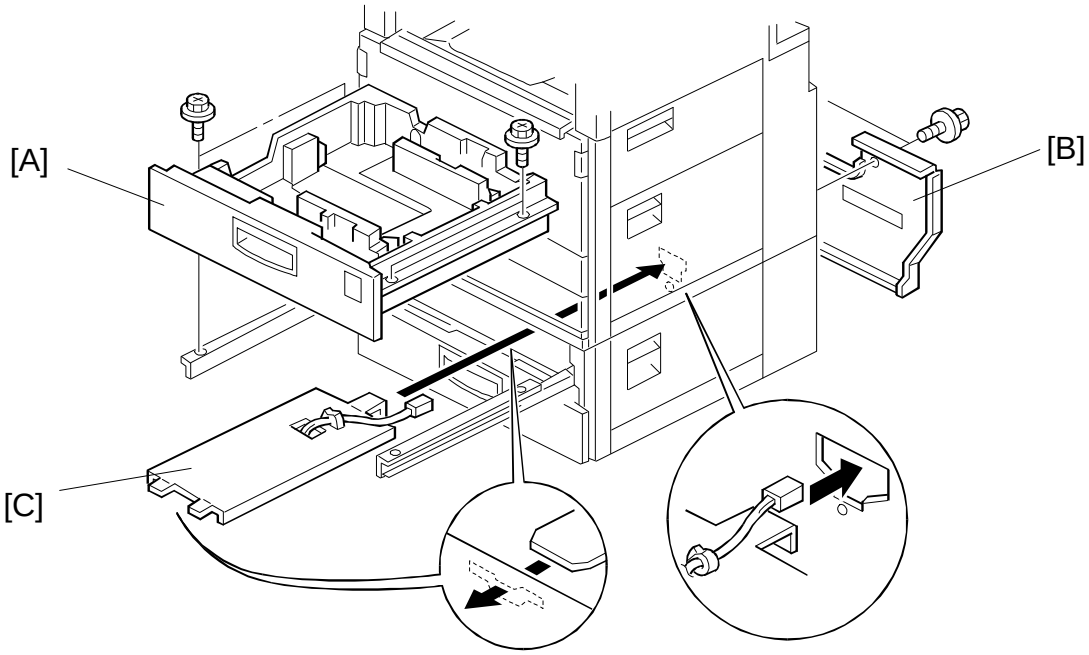
⚠ CAUTION

Unplug the copier power cord before starting the following procedure.

1. Remove the 2nd paper feed tray.
2. Install the clamp [A] on the base. Then, install the tray heater [B] (1 screw).
3. Connect the connector [C] of the heater to the copier's connector [D], which is on the rear frame.
4. Reassemble the machine.
5. Check the printer side-to-side registration (2nd paper tray).

   NOTE: Tell the customer that even when the copier's main switch is turned off, the copier power cord should be plugged in. Otherwise, the tray heater will not function.

2.11 TRAY HEATER (OPTIONAL PAPER TRAY UNIT)

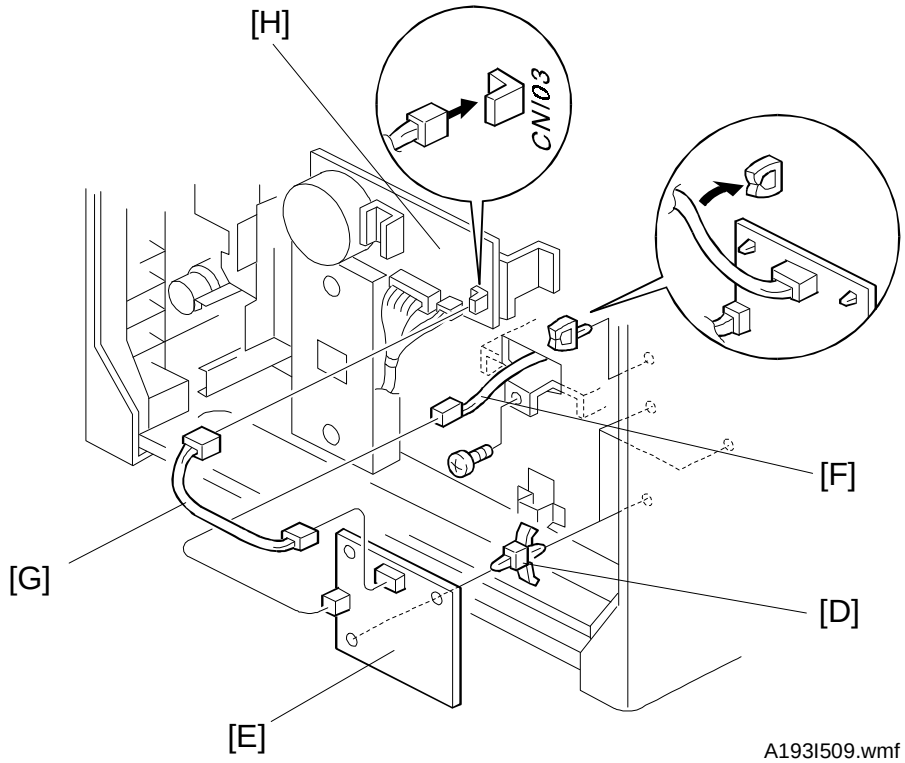


A193I508.wmf

⚠ CAUTION

Unplug the copier power cord before starting the following procedure.

1. Remove the upper paper tray [A] (4 screws).
2. Remove the rear cover [B] (2 screws).
3. Install the tray heater [C] (1 screw)



4. Install 3 clamps [D]
5. Install the interface board [E], and connect the tray heater harness [F] to the interface board. Then, clamp the harness as shown in the illustration.
6. Connect the interface harness [G] to the motor [H] and interface board.
7. Reassemble the machine.
8. Check the printer side-to-side registration (3rd and 4th tray).

NOTE: Tell the customer that even when the copier's main switch is turned off, the copier power cord should be plugged in. Otherwise, the tray heater will not function.

SECTION 4

SERVICE TABLES

1. SERVICE REMARKS

1.1 GENERAL CAUTION

Do not turn off the main switch while any of the electrical components are active. Doing so might cause damage to units, such as the PCU, when they are pulled out of or put back into the copier.

1.2 PCU

The PCU consists of the OPC drum, development unit, charge roller unit, and cleaning unit. Follow the cautions below when handling a PCU.

1. Never touch the drum surface with bare hands. When the drum surface is touched or becomes dirty, wipe it with a dry cloth or clean it with wet cotton. Wipe with a dry cloth after cleaning with the cotton.
2. Never use alcohol to clean the drum; alcohol dissolves the drum surface.
3. Store the PCU in a cool, dry place away from heat.
4. Take care not to scratch the drum as the drum layer is thin and is easily damaged.
5. Never expose the drum to corrosive gases such as ammonia gas.
6. Never shake the PCU. Doing so may cause toner and/or developer to spill out.
7. Do not bend the PCU. Doing so may cause toner and/or developer to spill out.
8. Dispose of used PCUs in accordance with local regulations.
9. Do not touch the charge roller with bare hands. Oil stains may cause black bands on copies due to excessive drum charge.
10. Prevent the charge roller from being exposed to dusty air. Dust on the charge roller may cause white spots on copies due to insufficient drum charge.
11. Never use alcohol or water to clean the drum charge roller. Alcohol or water corrode its surface. Wipe with a dry cloth.

1.3 TRANSFER ROLLER UNIT

1. Never touch the transfer belt surface with bare hands.
2. Take care not to scratch the transfer roller as the surface is easily damaged.

1.4 SCANNER UNIT

2. Clean the exposure glass with alcohol or glass cleaner to reduce the amount of static electricity on the glass surface.
3. Use a cotton pad with water or a blower brush to clean the mirrors and lens.
4. Do not bend or crease the exposure lamp flat cable.
5. Do not disassemble the lens unit. Doing so will throw the lens and the copy image out of focus.
6. Do not turn any of the CCD positioning screws. Doing so will throw the CCD out of position.

1.5 LASER UNIT

1. Do not loosen the screws that secure the LD drive board to the laser diode casing. Doing so would throw the LD unit out of adjustment.
2. Do not adjust the variable resistors on the LD unit, as they are adjusted in the factory.
3. The polygon mirror and F-theta mirror are very sensitive to dust. Never open the optical housing unit.
4. Do not touch the glass surface of the polygon mirror motor unit with bare hands.

1.6 FUSING UNIT

1. After installing the fusing thermistor, make sure that it is in contact with the hot roller and that it rotates freely.
2. Be careful not to damage the edges of the hot roller strippers or their tension springs.
3. Do not touch the fusing lamp and rollers with bare hands.
4. Make sure that the fusing lamp is positioned correctly and that it does not touch the inner surface of the hot roller.

1.7 PAPER FEED

1. Do not touch the surface of the pick-up, feed, and separation rollers.
2. The side fences and end fences of the paper tray must be positioned correctly to align with the actual paper size to avoid paper misfeeds.

1.8 OTHERS

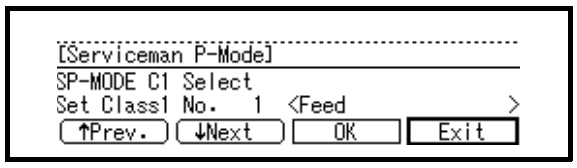
1. The TD sensor initial setting is performed automatically after installing the new PCU and closing the front cover. Never open the front cover or turn off the main switch during this time. The main motor stops when the initial setting has finished.
2. The toner bottle should be replaced while the main switch is on.
3. If the optional tray and anti-condensation heaters have been installed, keep the copier power cord plugged in, even when the copier main switch is turned off. This keeps the heaters energized.

2. SERVICE PROGRAM MODE

2.1 SERVICE PROGRAM MODE OPERATION

The service program (SP) mode is used to check electrical data, change modes, and adjust values.

2.1.1 Service Program Access Procedure



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1) How to enter the SP mode

Press the following keys in sequence.

[Interrupt/Copy] → [1] → [0] → [7] → [C/Stop]

Hold the [C/Stop] key for more than 3 seconds.

2) How to exit SP mode

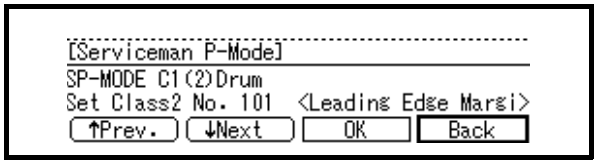
Press the [Interrupt/Copy] key or exit key three times.

2.1.2 Accessing Copy Mode from within an SP Mode

1. Press the Interrupt key.
2. Select the appropriate copy mode and make trial copies.
3. To return to the SP mode, press the Interrupt key again.

2.1.3 How to select the program number

Program numbers are composed of two or three levels.



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To input the required program number, select each program level in sequence.

1. Select the 1st level program number at the numeric key pad and press the # key or OK key.

   NOTE: The 1st level program number can be selected using the arrow keys or Prev key or Next key.

2. Select the 2nd level program number at the numeric key and press the # key or OK key.

   NOTE: The 2nd level program number can be selected using the arrow keys or Prev key or Next key.

3. If there any are third level programs in the SP mode, they can be selected the same way as the 1st and 2nd level SP modes.

   NOTE: The 3rd level program number can be selected using the arrow keys or Prev key or Next key.

2.1.4 To Input a Value or Setting for an SP Mode

1. Enter the required program mode as explained above.
2. Enter the required setting using the numeric keys, then press the # key or OK key.

   NOTE: If you forget to press the # key or OK key, the previous value remains.

3. Exit SP mode.

Service Tables

2.2 SERVICE PROGRAM MODE TABLES

2.2.1 Main SP Mode Table

NOTE: 1) In the Function column, comments are in italics.
2) In the Settings column, the default value is in bold letters.
3) An asterisk " * " after the mode number means that this mode is stored in the NVRAM. If the RAM is reset, all these SP modes will return to their factory settings.

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
1-001 *	1	Leading Edge Registration (Normal copying, and duplex 1st side)	Adjusts the printing leading edge registration using the Trimming Area Pattern (SP5-902, No.10).	+9 ~ -9 0.1 mm/step **+ 0.0 mm**
			Use the •/∗ key to toggle between + and -. The specification is 3 ±2 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.	
	2	Leading Edge Registration (Duplex: 2nd side)	Adjusts the printing leading edge registration using the Trimming Area Pattern (SP5-902, No.10).	+12.5 ~ -12.5 0.1 mm/step **+ 0.0 mm**
			Use the •/∗ key to toggle between + and -. The specification is 3 ±2 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.	
1-002 *	1	Side-to-Side Registration (1st paper feed)	Adjusts the printing side-to-side registration from the 1st paper feed station using the Trimming Area Pattern (SP5-902, No.10).	+9 ~ -9 0.1 mm/step + 0.0 mm
			Use the •/∗ key to toggle between + and -. The specification is 2 *±1.5 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.*	
	2	Side-to-Side Registration (2nd paper feed)	Adjusts the printing side-to-side registration from the 2nd paper feed station using the Trimming Area Pattern (SP5-902, No.10).	+9 ~ -9 1 mm/step **+ 0.0 mm**
			Use the •/∗ key to toggle between + and -. The specification is 2 ±1.5 mm.	
	3	Side-to-Side Registration (3rd paper feed: Option PFU tray 1)	Adjusts the printing side-to-side registration from the 3rd paper feed station using the Trimming Area Pattern (SP5-902, No.10).	+9 ~ -9 1 mm/step + 0.0 mm
			Use the •/∗ key to toggle between + and -. The specification is 2 ±1.5 mm.	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-002 *	4	Side-to-Side Registration (4th paper feed: Option PFU tray 2)	Adjusts the printing side-to-side registration from the 4th paper feed station using the Trimming Area Pattern (SP5-902, No.10). *Use the •/∗ key to toggle between + and -. The specification is 2 ±1.5 mm.*	+9 ~ -9 0.1 mm/step + 0.0 mm
	5	Side-to-Side Registration (By-pass feed)	Adjusts the printing side-to-side registration from the by-pass feed table using the Trimming Area Pattern (SP5-902, No.10). *Use the •/∗ key to toggle between + and -. The specification is 2 ±1.5 mm.*	+9 ~ -9 0.1 mm/step + 0.0 mm
	6	Side-to-Side Registration (Duplex)	Adjusts the printing side-to-side registration from the duplex tray using the Trimming Area Pattern (SP5-902, No.10). *Use the •/∗ key to toggle between + and -. The specification is 2 ±1.5 mm.*	+9 ~ -9 0.1 mm/step **+ 0.0 mm**
1-003 *	1	Paper Feed Timing (Paper Feed Trays)	Adjusts the relay clutch timing at registration. The relay clutch timing determines the amount of paper buckle at registration. (A larger setting leads to more buckling.)	0 ~ 10 1 mm/step **7 mm**
	2	Paper Feed Timing (By-pass)		0 ~ 10 1 mm/step **8 mm**
1-006 *		Double copy registration	Adjusts the position of the second copy from the center line in double copy mode. *Use the •/∗ key to toggle between + and -. See "Replacement and Adjustment - Copy Image Adjustments" for details.*	+9 ~ -9 1 mm/step **+ 0 mm**
1-007 *		By-pass Feed Paper Size Display	Displays the paper width sensor data for the by-pass feed table.	
1-105 *	1	Fusing Temperature Adjustment (Operation)	Adjusts the fusing temperature in the operation mode.	100 ~ 200 *1°C/step* **180°C**
	2	Fusing Temperature Adjustment (Energy Saver Level 2)	Adjusts the fusing temperature in the energy saver level 2 mode. *With a lower value, the machine takes more time to reach the ready condition.*	0 ~ 165 *1°C/step* **140°C (115V machine)** **0°C (230V machine)**
1-106		Fusing Temperature Display	Displays the fusing temperature. *Press the ⊡/⊡ key to exit the display.*	
1-901		Auto Restart Interval	**Do not change the value.**	

Service Tables

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
1-902		Fusing Control Frequency Display	Displays the fusing control frequency which is detected by the zero cross signal generator. *Around "50" equals 50 Hz. Around "60" equals 60 Hz.*	
2-001 *		Charge Roller Bias Adjustment	Adjusts the voltage applied to the charge roller. ***Do not change the value.***	-1000 ~ -2500 1 V/step **- 1750 V**
2-101 *	1	Leading Edge Erase Margin (Printing)	Adjusts the leading edge erase margin. *The specification is 3 ±2 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.*	0 ~ 9 1 mm/step **3.0 mm**
	2	Trailing Edge Erase Margin (Printing)	Adjusts the trailing edge erase margin. *The specification is 2 ±2 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.*	0 ~ 9 1 mm/step **2.0 mm**
	3	Left Side Edge Erase Margin (Printing)	Adjusts the left side erase margin. *The specification is 2 ±1.5 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.*	0 ~ 9 1 mm/step **2.0 mm**
	4	Right Side Edge Erase Margin (Printing)	Adjusts the right side erase margin. *The specification is 2 ±1.5 mm. See "Replacement and Adjustment - Copy Image Adjustments" for details.*	0 ~ 9 1 mm/step **2.0 mm**
2-103 *		LD Power Adjustment	Adjusts the LD power. ***Do not change the value.***	-128 ~ +127 1 μW/step **- 103**
2-106*		ID Adjustment for a Test Pattern	Adjusts the image density level for black pixels on test pattern printouts (made with SP5-902).	0 ~ 255 1/step **255**
2-201 *		Development Bias Adjustment	Adjusts the development bias during copying. *This can be adjusted as a temporary measure if faint copies appear due to an aging drum.*	-200 ~ -900 1 V/step **- 600 V**
2-213*		Number of Copies After Toner Near End Detection	Selects the number of copies after toner near-end has been detected.	**0: 50 copies** 1: 20 copies
2-220 *		V_T Display	Displays the TD sensor output voltage. *Press the [Exit] key to exit the display.*	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
2-301 *	1 *	Transfer Current Adjustment (Paper Tray)	Adjusts the current applied to the transfer roller during printing from the paper tray. *If the user uses thicker paper, the current may have to be increased to ensure sufficient transfer of toner.*	0: -2 μA **1: 0 μA** 2: +2 μA 3: +4 μA
	2 *	Transfer Current Adjustment (By-pass Feed Table)	Adjusts the current applied to the transfer roller during printing from the by-pass feed table. *If the user uses thicker paper, the current may have to be increased to ensure sufficient transfer of toner.*	0: -2 μA **1: 0 μA** 2: +2 μA 3: +4 μA
	3	Transfer Current Adjustment (Duplex)	Adjusts the current applied to the transfer roller during printing from the duplex tray. *If the user uses thicker paper, the current may have to be increased to ensure sufficient transfer of toner.*	0: -2 μA **1: 0 μA** 2: +2 μA 3: +4 μA
	4	Transfer Current Adjustment (Cleaning)	Adjusts the current applied to the transfer roller during roller cleaning. *If toner remains on the roller after cleaning, increase the current.*	-10 ~ 0 1 μA/step **- 4 μA**
2-801		TD Sensor Initial Setting	Performs the TD sensor initial setting. This SP mode controls the voltage applied to the TD sensor to make the TD sensor output about 2.0 V. *After installing a new PCU, the machine performs this function automatically.* ***Do not use this SP mode.***	**0: No** 1: Yes
2-901*	1	Separation Voltage Adjustment (Front side - leading edge)	Adjusts the discharge brush voltage at the leading edge on the front side. *Increase if the paper is getting wrapped around the drum.*	-1000 ~ -4000 1 V/step **- 2300 V**
	2	Separation Voltage Adjustment (Front side - other areas)	Adjusts the discharge brush voltage on the front side except at the leading edge.	-1000 ~ -4000 1 V/step **- 2300 V**
	3	Separation Voltage Adjustment (Rear side - leading edge)	Adjusts the discharge brush voltage at the leading edge on the rear side. *For the rear side in duplex mode, higher voltage is needed. the paper has more static on it, and there is toner on one side of the paper.*	-1000 ~ -4000 1 V/step **- 3000 V**
	4	Separation Voltage Adjustment (Rear side - other areas)	Adjusts the discharge voltage on the rear side except at the leading edge.	-1000 ~ -4000 1 V/step **- 3000 V**

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
2-902*		FCI Smoothing (Letter Mode)	Selects whether the FCI smoothing function to remove jagged edges is enabled or disabled (this adjustment does not affect fax mode)	0: No (Disabled) **1: Yes (Enabled)**
2-903*	1	LD PWM Laser Pulse Positioning (Independent Pixels)	Selects the laser pulse positioning type that is used for independent black or gray pixels (white pixels to left and right). *Item 3 is not used.*	**0: Center** 1: Right 2: Left 3: Concentrated
	2	LD PWM Laser Pulse Positioning (Left Edge)	Selects the laser pulse positioning type that is used for the the leftmost pixel of a series of black or gray pixels. *Item 3 is not used.*	0: Center **1: Right** 2: Left 3: Concentrated
	3	LD PWM Laser Pulse Positioning (Right Edge)	Selects the laser pulse positioning type that is used for the rightmost pixel of a series of black or gray pixels. *Item 3 is not used.*	0: Center 1: Right **2: Left** 3: Concentrated
	4	LD PWM Laser Pulse Positioning (Continuous)	Selects the laser pulse positioning type that is used for pixels in the middle of a series of black or gray pixels. *Item 3 is not used.*	**0: Center** 1: Right 2: Left 3: Concentrated
2-904*	1	ID Adjustment - Binary Processing Mode (Independent pixel)	Density of independent black or gray pixels in binary processing mode (white pixels to left and right).	0 ~ 255 1/step **128**
	2	ID Adjustment - Binary Processing Mode (Left Edge)	Density of the leftmost pixel of a series of black or gray pixels in binary processing mode.	0 ~ 255 1/step **128**
	3	ID Adjustment - Binary Processing Mode (Right Edge)	Density of the rightmost pixel of a series of black or gray pixels in binary processing mode.	0 ~ 255 1/step **255**
	4	ID Adjustment - Binary Processing Mode (Continuous)	Density of pixels in the middle of a series of black or gray pixels in binary processing mode.	0 ~ 255 1 / step **255**
	The threshold value for binary picture mode is set with SP 4-418. The SP2-904 settings determine how black the black pixels are.			

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-905		Gradation Type	This is for the designer's test purposes. **Do not change the value.**	
2-907*		Laser Pulse Positioning	Selects the laser pulse position type that is used for test pattern printouts (printed with SP5-902). *Item 3 is not used.*	**0: Center** 1: Left 2: Right 3: Concentrated
2-908		Forced Toner Supply	Forces the toner bottle to supply toner to the toner supply unit for 1.5 minutes. *Toner supply finishes automatically after 1.5 minutes. This process is not normally needed in the field for this model, as the machine can handle most cases where toner runs short temporarily.*	**0: No** 1: Yes
2-909		Forced Charge Roller Cleaning	Forces charge roller cleaning. *After selecting "1", press Enter or [#] to start this feature. Press [C] to stop.*	**0: No** 1: Yes
2-910		Forced Transfer Roller Cleaning	Forces transfer roller cleaning. *After selecting "1", press Enter or [#] to start this feature. Press [C] to stop.*	**0: No** 1: Yes
2-911*		Image Density Selection	Selects the humidity coefficients for determining V_{TREF} and V_{TE} from the TD sensor initial setting output. *This setting can be adjusted by the key operator to make image density lighter or darker (see Replacement and Adjustment - Image Density Adjustment by Key Operator).*	0: Darker 1: Dark **2: Normal** 3: Light 4: Lighter
2-912*		Charge Roller Temperature Correction	Corrects the charge roller temperature. *If a copy with a dirty background is made, this value should be increased. However, **do not use this SP mode unnecessarily.***	-5 ~ +5 1 (25V)/step **0**
2-913*		Auto TD Sensor Initial Setting Mode	Selects whether or not the TD sensor initial setting process is performed automatically at installation. *Select "No" if the PCU detection mechanism has a problem. However, **usually do not use this SP mode.***	0: No **1: Yes**
2-916*		Printer γ Table (GAVD) Selection	Selects the printer γ table (GAVD) type. *This SP mode is only effective in the grayscale processing mode.* *A larger value gives a darker image.*	1 ~ 4 1/Step **2**
2-980		Humidity Sensor Output Display	Displays the humidity sensor output data in hex code as %Rh.	

Service Tables

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
2-995*	1	TD Sensor Control Value Display (Factory)	Displays the TD sensor control value (V_{CONT}), which was adjusted in the factory. The machine normally uses this value, unless SP 2-999 is changed away from 0.	
	2	Factory V_{CONT} Counter	Displays what the total counter value was when the TD sensor control value was adjusted in the factory. *When V_{CONT} is adjusted at the factory, the counter is automatically set at "9999999".*	
2-996*	1	TD Sensor Control Value Setting	Inputs the TD sensor control value (V_{CONT}) *If the V_{CONT} voltage is out of specification after replacing the IOCSS board, adjust V_{CONT} using this SP mode. After changing this value, SP2-999 should be set at "1". See "Replacement and Adjustment - IOCSS Board".*	80 ~ 170 1/step **140**
	2	Manual V_{CONT} Counter	Displays what the total counter value was when the TD sensor control value was adjusted in the field.	
2-997*	1	TD Sensor Control Value Display (Installation)	Displays the TD sensor control value (V_{CONT}) which was adjusted at installation. The machine uses this value only if SP 2-999 is set to 2.	
	2	Installation V_{CONT} Counter	Displays what the total counter value was when the TD sensor control value was adjusted at machine installation.	
2-998*		Printer Main Scan Magnification	Adjusts the magnification in the main scan direction for the printer. *Use the •/* key to toggle between + and -. The specification is ± 1%. See "Replacement and Adjustment - Copy Image Adjustments" for details.*	- 0.5 ~ + 0.5 0.1%/step **0.0 %**
2-999*		TD Sensor Control Value Selection	Selects the TD sensor control voltage *If the V_{CONT} value is out of specification after replacing the IOCSS board, this value should be changed to "1" after inputting the correct value with SP 2-996. See "Replacement and Adjustment - IOCSS Board".*	**0: Factory** 1: Manual 2: Installation Never select 2.
4-008 *		Main Scan Magnification (Scanning)	Adjusts the magnification in the main scan direction for scanning. *Use the •/* key to toggle between + and -. See "Replacement and Adjustment - Copy Image Adjustments" for details.*	- 1.0 ~ + 1.0 0.5 %/step **+ 0.0 %**

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
4-010 *		Leading Edge Registration (Scanning)	Adjusts the leading edge registration for scanning. *(-): The image moves in the direction of the leading edge* *Use the •/∗ key to toggle between + and -.* *See "Replacement and Adjustment - Copy Image Adjustments" for details.*	- 2.0 ~ + 9.0 0.5 mm/step **+ 0.0 mm**
4-011 *		Side-to-side Registration (Scanning)	Adjusts the side-to-side registration for scanning. *(-): The image disappears at the left side.* *(+): The image appears.* *Use the •/∗ key to toggle between + and -.* *See "Replacement and Adjustment - Copy Image Adjustments" for details.*	- 6.0 ~ + 6.0 0.1 mm/step **+ 0.0 mm**
4-012 *	1	Leading Edge Erase Margin (Scanning)	Adjusts the leading edge margin for scanning. *Do not adjust this unless the user wishes to have a scanner margin that is greater than the printer margin.*	0.0 ~ 9.0 0.1 mm/step **1.0 mm**
	2	Trailing Edge Erase Margin (Scanning)	Adjusts the trailing edge margin for scanning. *See the comment for SP 4-012-1.*	0.0 ~ 9.0 0.1 mm/step **1.0 mm**
	3	Left Side Erase Margin (Scanning)	Adjusts the left side margin for scanning. *See the comment for SP 4-012-1.*	0.0 ~ 9.0 0.1 mm/step **1.0 mm**
	4	Right Side Erase Margin (Scanning)	Adjusts the right side margin for scanning. *See the comment for SP 4-012-1.*	0.0 ~ 9.0 0.1 mm/step **1.0 mm**
4-013		Scanner Free Run	Performs a scanner free run with the exposure lamp on. *After selecting "1", press Enter or # twice to start this feature. Press C/⊗ to stop.*	**0: No** 1: Yes
4-015*	1	White Plate Scanning Start Position	Adjusts the scanning start position on the white plate for auto shading. *The default is 6 mm from the leading edge. The setting specifies how far scanning starts from the default position.*	- 3.0 ~ + 6.0 0.5 mm/step **0 mm**
	2	White Plate Scanning Area	Adjusts the width of the area on the white plate (in the sub scan direction) that is scanned for auto shading. *The default is 5 mm (for 41 - 400% reproduction ratios) or 6.5 mm (25 - 40%). The current setting specifies the difference from these defaults.*	- 3.0 ~ + 6.0 0.5 mm/step **0 mm**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-101*		Sub Scan Magnification (Scanning: Book Mode)	Adjusts the magnification in the sub scan direction for scanning. If this value is changed, the scanner motor speed is changed. *Use the •/∗ key to toggle between + and -. See "Replacement and Adjustment - Copy Image Adjustments" for details.*	- 1.0 ~ + 1.0 0.5 %/step **+ 0.0 %**
4-301		APS and Platen/DF Sensor Output Display	Displays the status of the APS sensors and platen/DF cover sensor. *See "APS and Platen/DF Sensor Output Display" after the SP mode table.*	
4-303 *		APS Small Size Original Detection	Selects whether or not the copier determines that the original is A5 size when the APS sensor does not detect the size. *If "A5 lengthwise" is selected, paper sizes that cannot be detected by the APS sensors are regarded as A5 lengthwise. If "Not detected" is selected, "Original size" will be displayed.*	**0: No (Not detected)** 1: Yes (A5 lengthwise)
4-401*		Binary Processing Mode (Neg./Pos.)	**Japanese Version Only.** **Do not change the value**.	
4-402*		Binary Processing Mode (Marker Mode)	**Japanese Version Only.** **Do not change the value**.	
4-403*		Gradation Processing Mode for One-to-one Copying	Selects whether binary picture processing or grayscale processing mode is done. *For example, if binary processing mode is selected, all image processing is handled using binary picture processing mode. Note that memory copying always uses binary picture processing, regardless of this setting.*	**0: No (Grayscale processing)** 1: Yes (Binary processing)
4-406*		Marker Detection	**Japanese Version Only.** **Do not change the value**.	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-407*	1	MTF Filter Selection in Letter Mode (25% ~ 64%)	Selects the MTF filter level for Letter mode. A stronger filter gives sharper lines. *For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".* ***Never select "1".***	0 ~ 11 1/step **4**
	2	MTF Filter Selection in Letter Mode (65% ~ 154%)	Selects the MTF filter level for Letter mode. A stronger filter gives sharper lines. *For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".* ***Never select "1".***	0 ~ 11 1/step **7**
	3	MTF Filter Selection in Letter Mode (155% ~256%)	Selects the MTF filter level for Letter mode. A stronger filter gives sharper lines. *For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".* ***Never select "1".***	0 ~ 11 1/step **3**
	4	MTF Filter Selection in Letter Mode (257% ~ 400%)	Selects the MTF filter level for Letter mode. A stronger filter gives sharper lines. *For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".* ***Never select "1".***	0 ~ 11 1/step **10**
	5	Smoothing Filter Selection in Photo Mode	Selects the smoothing filter level for Photo mode. A stronger filter gives a smoother image. *For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".* ***Never select "1".***	0 ~ 8 1/step **3**
	6	MTF Filter Selection in Letter/Photo Mode	Selects the MTF filter level for Letter/Photo mode. A stronger filter gives sharper lines. *For how to adjust, refer to "Detailed Descriptions - Filtering and Main Scan Magnification/Reduction".* ***Never select "1".***	0 ~ 11 1/step **2**
4-410*		AGC Default Setting	Not used ***Do not change the value.***	- 5 ~ 2 1/step **0**

Service Tables

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-412*		Video Data Path	Selects one of the following video data outputs, which will be used for printing. **0. Normal video processing** 1. After auto shading processing 2. After MTF processing 3. After gamma correction 4. Data straight through (no video processing)	
			Do not change the value.	
4-417		IPU Test Pattern Print	Prints the test pattern for the IPU or selects one of the following video data outputs for printing. **0. No Print** 1. Grayscale 1 2. Grayscale 2 3. Vertical Bands 4. Vertical Line - 1 dot 5. Vertical Line - 2 dot 6. Grid Pattern 7. SBU Test 1 8. SBU Test 2 9. SBU Test 3	
			Change to the copy mode display by pressing the "Interrupt" key, then print the test pattern.	
4-418*	1	Threshold Level in Letter Mode	Selects the threshold level for Letter Mode - *Binary picture processing mode*	0 ~ 255 1/step 48
	2	Threshold Level in Letter/Photo Mode	Selects the threshold level for Letter/Photo Mode - *Binary picture processing mode*	0 ~ 255 1/step 240
4-419*	1	Threshold Level for Marker Mode (Main scan magnification)	**Japanese version only.**	
	2	Threshold Level for Marker Mode (Sub scan magnification)		

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
4-421*	1	Dither Pattern Selection (Grayscale Mode/Photo Mode)	Selects the dither pattern used in grayscale processing mode. *A greater number of lines gives a more detailed copy. If the value is changed, the UP mode setting is also changed.*	**0: 180-line** 1: 140-line 2: 95-line
	2 *	Dither Pattern Selection (Binary Picture/Photo Mode)	Selects the dither pattern used in binary picture processing mode. *A greater number of lines gives a more detailed copy. If the value is changed, the UP mode setting is also changed.*	0: 95-line 1: 70-line **2: 140-line**
4-902		Exposure Lamp On	Turns on the exposure lamp. *To turn off the exposure lamp, select "0".*	**0: No (Off)** 1: Yes (On)
4-904*		SBU Gain Adjustment	Adjusts the coefficient of the D/A converter for the standard AGC gain curve ***Do not adjust this value.*** *However, after performing the memory all clear (SP5-801), use it to re-input the previous value.*	0 ~ 255 1/step **30**
4-905*		SBU DC Count Adjustment	Adjusts the coefficient of the D/A converter for the AGC gain curve for dc count. ***Do not adjust this value.*** *However, after performing the memory all clear (SP5-801), use it to re-input the previous value.*	0 ~ 255 1/step **30**
4-906*		SBU Reference Value Adjustment	Adjusts the coefficient of the D/A converter for the AGC gain curve for scanning the white plate. ***Do not adjust this value.*** *However, after performing the memory all clear (SP5-801), use it to re-input the previous value.*	0 ~ 255 1/step **147**
4-907*		SBU Offset Value Adjustment	Adjusts the coefficient of the D/A converter for the offset (Z/C) for the analog image data processing ***Do not adjust this value.*** *However, after performing the memory all clear (SP5-801), use it to re-input the previous value.*	0 ~ 255 1/step **180**
4-908*		SBU Auto Adjustment	Performs the auto scanner adjustment. *Using this SP mode after replacing the white plate or the memory on the BICU board. See "Replacement and Adjustment - Standard White Level" for details on how to do this.*	**0: Normal operation** 1: Start the adjustment
4-909*		EDU Test Mode	**Japanese version only.** **Do not change the value.**	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
4-910*		Scanner Motor Control Method	Selects the scanner motor control method. *If "1" is selected, the current for the scanner motor will be reduced and jitter copy image problems will be alleviated. However, copy speed will be reduced.*	**0: Normal** 1: Special
4-912*	1	White Level Value Display (Current)	Displays the current white level value.	
	2	White Level Value Display (Factory)	Displays the white level value for the white plate scanned at the factory.	
4-913*		Shading Interval Time in DF mode	Adjusts the interval for shading processing in DF mode. *Light and heat may affect the scanner response. If copy quality indicates that white level is drifting during a DF copy job, reduce this setting.*	0 ~ 60 1 s/step **30 s**
5-001*		All Indicators On	Turns on all indicators on the operation panel. *Press [#] to check.* *Press [C] to exit this SP mode.*	
5-103*		Auto Paper Tray Shift	Selects whether auto paper tray shift is done or not.	**0: No** 1: Yes
5-104 *		A3/11"x17" Double Count	Specifies whether the counter is doubled for A3/11"x17" paper. *If "YES" is selected, the total counter (mechanical counter) and the current user code counter counts up twice when A3/11"x17" paper is used.*	**No** Yes
5-106 *		ADS Level Selection	Selects the image density level that is used in ADS mode.	1 ~ 7 1 notch/step **4**
5-113*		Option Counter Type	**Japanese version only.** **Do not change the value.**	
5-116*		Total Counter Up Timing	Determines whether the total counter counts up at paper feed-in or at paper exit.	**0: Feed-in** 1: Exit

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
5-401*	1	User Code Mode (Copier)	Selects whether the user code function is enabled in copy mode or not. *If this value is changed, the UP mode setting is also changed.*	**0: No** 1: Yes
	2	User Code Mode (Fax)	Selects whether the user code function is enabled in facsimile mode or not. *If this value is changed, the UP mode setting is also changed.*	**0: No** 1: Yes
	3	User Code Mode (Printer)	Selects whether the user code function is enabled in printer mode or not. *If this value is changed, the UP mode setting is also changed.*	**0: No** 1: Yes
5-501 *	1	PM Alarm Interval	Sets the PM interval, with an alarm. The Auto Service Call feature of the fax option also refers to this setting. *When the setting is "0", this function is disabled.*	0 ~ 255 1k copies/step **100 k copies**
	2	PM Alarm	Selects whether the PM alarm is enabled or not. If this is "0", the Auto Service Call feature of the fax option is also disabled.	0: No **1: Yes**
	3	PM Alarm (Original)	**Japanese version only.** **Do not change the value.**	
5-504*		PM Alarm (Jam Alarm)	**Japanese version only.** **Do not change the value.**	
5-507*	1	PM Alarm (Copy Size)	**Japanese version only.** **Do not change the value.**	
	2	PM Alarm (Staple)		
	3	PM Alarm (Toner End)		
5-508*	1	CE Call (Jam Level 1)	**Japanese version only.** **Do not change the value.**	
	2	CE Call (Jam Level 2)		
	3	CE Call (Door Open)		
5-801		Memory All Clear	Resets all software counters. Also, returns all modes and adjustments to the default settings. See the "MEMORY ALL CLEAR" section for how to use this SP mode correctly. ***Normally, this SP mode should not be used.*** *It is used only after replacing the NVRAM, or when the copier malfunctions due to a damaged NVRAM.*	

Service Tables

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
5-802		Free Run	Performs a free run for both the scanner and the printer. *To perform the free run, press 1 then press # twice. Press C/⊘ to stop.*	**0: No** 1: Yes
5-803		Input Check	Displays the signals received from sensors and switches. See the "INPUT CHECK" section for details. *Press ⊘/⊘ to exit the program.*	
5-804		Output Check	Turns on the electrical components individually for test purposes. See the "OUTPUT CHECK" section for details.	
5-808*	1	Display Language (115V machines)	Selects the display language for 115V machines.	**0: English** 1: French 2: Spanish
	2	Display Language (230V machines - Standard)	Selects the standard display language for 230V machines.	**0: English** 1: German 2: Dutch 3: French 4: Italian 5: Spanish
	3	Display Language (230V machines - Option)	Selects the option display language for 230V machines.	**0: English** 1: German 2: Dutch 3: Swedish 4: Norwegian 5: Danish
5-810		SC Code Reset	Resets any service call condition. After performing this SP mode, turn the machine main switch off and on. See "Troubleshooting - Service Call Conditions" for how to use this mode.	**0: No** 1: Yes
5-812 *		Service Telephone Number	Use this to input the telephone number of the service representative (this is displayed when a service call condition occurs). *Press the "•/#" key if you need to input a pause (—).* *Press the ⊘/⊘ key to delete the telephone number.*	
5-816*		CSS Function	**Japanese version only.** **Do not change the value.**	
5-817	1	CE Start Call	**Japanese version only.** **Do not change the value.**	
	2	CE Finish Call		

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
5-901		Printer Free Run	Performs the printer free run. *To perform the free run, press 1 then press # twice. Press C/⊘ to stop.*	**0: No** 1: Yes
5-902		Test Pattern Printouts	Prints the test pattern. *See the "TEST PATTERN PRINTING" section for how to print a test pattern.* *Change to the copy mode display by pressing the "Interrupt" key, then print out the test pattern.*	
5-903*		LCD Contrast Adjustment	Adjusts the contrast for the LCD on the operation panel. *Use the "Zoom" (+ or -) key to change the contrast.*	1 ~ 7 1/step **4**
5-904*		Auto Shut Off Mode Timer Setting	Inputs the auto off mode timer. *If "0" is selected, the auto timer function is disabled.*	0 ~ 120 1 min/step **30**
5-905*		CSS 25H Off Detection	**Japanese version only.** **Do not change the value.**	
5-906*		Fan Control Timer Setting	Inputs the fan control timer in the energy saver mode *This time is for entering the fan motor control mode after the fusing lamp off or the main motor turns off.*	30 ~ 120 1 s / step **30**
5-907		Brand Name and Production Name Setting	Selects the brand name and the production name for the Plug and Play function of Windows 95. The brand name and the production name for the Plug and Play function is registered in the NVRAM. If the NVRAM is defective, these names should be registered. *Press down the "Photo mode" key and the # key at the same time to register the setting.*	
5-911*		APS A4/LT Sideways Priority	Specifies whether the machine selects LT sideways paper if the original is A4. If "Yes" is selected, LT sideways is selected automatically when the APS sensors detect an A4 sideways original. This feature does not work in reverse (A4 sideways paper is not selected for an LT sideways original).	**0: No** 1: Yes
5-912	1	PCU Alarm Interval	Inputs the PCU alarm interval. *When the machine reaches the value, "Change Photoconductor Unit" will be displayed on the LCD to inform the user.*	**1 ~ 255** 1 k / Step **45 k**
	2	PCU Alarm Mode	Selects whether the PCU alarm function is performed or not.	0: No **1: Yes**

Service Tables

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
5-930*		Fax Forwarding Mode	Selects whether the fax mode application key is accepted or not in the SC condition. *When an SC condition occurs while incoming data has been stored in the SAF memory, change the value to "1" to access fax mode. Then forward the incoming data to another fax machine by using the fax mode bit switches.*	**0: No** 1: Yes
5-932		Program Download	Downloads the system program from a ROM board to the Flash Memory on the BICU board. (Copier mode softawre only) See "Service Tables - Program Download" for details. *This SP can be operated when the ROM board is installed in the machine.*	**0: No** 1: Yes
5-940*		Image Rotation Mode	Selects whether the image rotation function is performed or not. *If there is a problem with the MSU, image rotation may lead to abnormal copies. If so, disable image rotation while waiting for new parts.*	**0: Yes** 1: No
5-941*		Duplex Blank Page	Selects whether the blank page is made on the front side or back side when duplex copy mode is selected.	**0: Back side** 1: Front side
5-942*		Image Compression Method	Selects the image compression method for memory mode copying.	0: MH 1: MR **2: MMR**
5-943*		Charge Roller H.P Detection	Selects whether the charge roller home position is detected or not. ***Do not use in the field.***	**0: No** 1: Yes
5-944*		APS Mode	Selects whether the APS mode is selected as power-up default or not.	0: No **1: Yes**
5-945*		Memory Copy Priority	Selects whether or not the memory copy mode is selected when the main switch is turned on.	0: No **1: Yes**
5-991*		VRAM Data Download	**This SP mode is only used by the designer.** **Do not change the value.**	**0: Off** 1: On
5-992		System Parameter and Data List Printing	Prints the machine status history data list. See the "SYSTEM PARAMETER AND DATA LISTS" section for how to print the lists.	**0: No Print** 1: SP mode 2: UP mode 3: Log data

Mode No.			Function	Settings
Class 1 and 2	Class 3			
6-006 *	1	ADF Side-to Side Registration	Adjusts the printing side-to-side registration in the ADF mode. *Use the •/∗ key to toggle between + and -.*	-1.5 ~ +1.5 0.5 mm/step **+ 0.0 mm**
	2	ADF Leading Edge Registration	Adjusts the leading edge registration in the ADF mode. *Use the •/∗ key to toggle between + and -.*	-10 ~ +10 0.5 mm/step **+ 6.0 mm**
	3	ADF Trailing Erase Margin	Adjusts the trailing edge erase margin in ADF mode. *Use the •/∗ key to toggle between + and -.*	-3.0 ~ +3.0 0.1 mm/step **+ 0.0 mm**
6-007*		ADF Sub-scan Magnification	Adjusts the magnification in the sub-scan direction for ADF mode. *Use the •/∗ key to toggle between + and -. See "Replacement and Adjustment - Copy Image Adjustments" for details.*	- 4.0 ~ + 4.0 0.1 %/step **0.0 %**
6-009		ADF Free Run	Performs an ADF free run. *To perform the free run, press 1 then press # twice. Press C/⊘ to stop.*	**0: No** 1: Yes
6-010*		Stamp Position Adjustment	Adjusts the stamp position in the sub-scan direction in facsimile mode.	- 10 ~ + 10 1 mm/step **0 mm**
6-901		ADF Original Sensor Output Display	Displays the status of the original sensor for the ADF and paper size. *See "DF APS Original Sensor Output Display" after the SP mode table.*	
6-902*		ADF Original Scanning Method	Selects the original scanning method in ADF mode.	**0: Original** 1: Copy paper size + magnification
6-903*		Original Non-waiting Start	Selects whether the original non-waiting start is performed or not. *If the user often feeds originals that slip, and the leading edge is catching up with the trailing edge of the previous page, set this SP mode to No.*	0: No 1: Yes
6-904*		Original Scanning Interval	Adjusts the interval between originals in original non-waiting start mode. *This SP mode is only effective when SP 6-903 is set at "1".*	30 ~ 50 1 mm/step 40 mm
6-905*		ARDF Skew Correction	Selects whether the skew correction is done or not when the ARDF feeds the rear side of the original.	**0: Yes** 1: No
6-906*		ARDF Original Curl Adjustment	Adjusts the amount of original at the ARDF registration roller when the ARDF feeds the rear side of the original. *This SP mode is only effective when SP 6-905 is at "0."*	10 ~ 40 1 mm/step **15 mm**

Service Tables

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
6-910		ADF and Printer Free Run	Performs both an ADF and printer free run . *To perform the free run, press 1 then press # twice. Press C/⊘ to stop.*	**0: No** 1: Yes
7-001		Total Operation Time Display	Displays the total operation time (total drum rotation time).	
7-002*	1	Total Original Counter (Copy + Fax)	Displays the total number of scanned originals (copy + fax modes).	
	2	Total Original Counter (Copy	Displays the total number of scanned originals (copy mode only).	
	3	Total Original Counter (Fax)	Displays the total number of scanned originals (fax mode only).	
7-003*	1	Total Copy Counter (All Modes)	Displays the total number of copies (all modes).	
	2	Total Copy Counter (Copy mode)	Displays the total number of copies (copy mode only).	
	3	Total Copy Counter (Fax mode)	Displays the total number of copies (fax mode only).	
	4	Total Copy Counter (Printer mode)	Displays the total number of copies (printer mode only).	
7-004*		CE Counter Reset	**Japanese version only.** **Do not change the value.**	
7-101*	1	Total Copies by Paper Size (A3)	Displays the total number of copies by paper size.	
	2	Total Copies by Paper Size (B4)		
	3	Total Copies by Paper Size (A4)		
	4	Total Copies by Paper Size (B5)		
	5	Total Copies by Paper Size (11" X 17")		
	6	Total Copies by Paper Size (8 1/2" X 14")		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-101*	7	Total Copies by Paper Size (8 1/2" X 11")	Displays the total number of copies by paper size.	
	8	Total Copies by Paper Size (8 1/2" X 5 1/2")		
	9	Total Copies by Paper Size (Other Size)		
7-201*		Total Number of Scanning	Displays the total number of scanned originals.	
7-204*	1	Total Paper Tray Counter (1st paper tray)	Displays the total number of copies fed from each paper feed tray.	
	2	Total Paper Tray Counter (2nd paper tray)		
	3	Total Paper Tray Counter (3rd paper tray)		
	4	Total Paper Tray Counter (4th paper tray)		
	5	Total Paper Tray Counter (By-pass feed)		
	6	Total Paper Tray Counter (Duplex tray)		
7-205*		ADF Total Counter	Displays the total number of originals fed by the ADF.	
7-301*	1	Total Copies by Reproduction Ratio (25% ~ 49%)	Displays the total number of copies by reproduction ratio.	
	2	Total Copies by Reproduction Ratio (50% ~ 99%)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-301*	3	Total Copies by Reproduction Ratio (Full size)	Displays the total number of copies by reproduction ratio.	
7-301*	4	Total Copies by Reproduction Ratio (101% ~ 200%)	Displays the total number of copies by magnified	
	5	Total Copies by Reproduction Ratio (201% ~ 400%)		
	6	Total Copies by Reproduction Ratio (Direct Mag.)		
	7	Total Copies by Reproduction Ratio (Direct Size Mag.)		
	8	Total Copies by Reproduction Ratio (Size Mag.)		
7-303*	1 ~ 23	Total Copies by Image Editing Mode	**Japanese version only.**	
	24	Total Copies by Image Editing Mode (Memory Sort)	Displays the total number of copies by image editing mode.	
	25	Total Copies by Image Editing Mode (Combine)		
	26	Total Copies by Image Editing Mode (Repeat Copy)		
	27	Total Copies by Image Editing Mode (Erase Copy)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-304*	1	Total Copies by Copy Mode (Overlay)	Displays the total number of copies by copy mode.	
	2	Total Copies by Copy Mode (Letter)		
	3	Total Copies by Copy Mode (Letter/Photo)		
	4	Total Copies by Copy Mode (Photo)		
	5	Total Copies by Copy Mode (Duplex)		
	6	Total Copies by Copy Mode (ADF)		
	7	Total Copies by Copy Mode (Double-copy)		
7-401*		Total SC Counter	Displays the total number of service calls that have occurred.	
7-501*		Total Jam Counter (Copies + Original)	Displays the total number of copy jams and original jams.	
7-502*		Total Copy Jam Counter	Displays the total number of copy jams.	
7-503*		Total Original Jam Counter	Displays the total number of original jams.	
7-504*	1	Total Jam by Location (A Jam)	Displays the total copy paper jam counter by location.	
	2	Total Jam by Location (B Jam)		
	3	Total Jam by Location (C Jam)		
	4	Total Jam by Location (Y Jam)		
	5	Total Jam by Location (E Jam)		

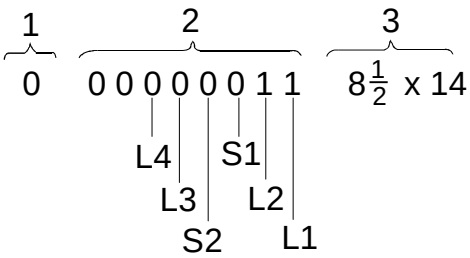
Service Tables

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-504*	6	Total Jam by Location (R Jam)	Displays the total copy paper jam counter by location.	
	7	Total Jam by Location (F Jam)		
	8	Total Jam by Location (1st Paper Tray)		
	9	Total Jam by Location (2nd Paper Tray)		
	10	Total Jam by Location (3rd Paper Tray)		
	11	Total Jam by Location (4th Paper Tray)		
	12	Total Jam by Location (By-pass Feed)		
	13	Total Jam by Location (Duplex Tray)		
7-801	1	ROM/CPU Version (IOCSS)	Displays the ROM version. **NOTE:** **Class 3 nos, 3, 7, and 8 are used only for the Japanese version.**	
	2	ROM/CPU Version (BiCU)		
	3	ROM/CPU Version (Edit)		
	4	ROM/CPU Version (Duplex)		
	5	ROM/CPU Version (Fax Control)		

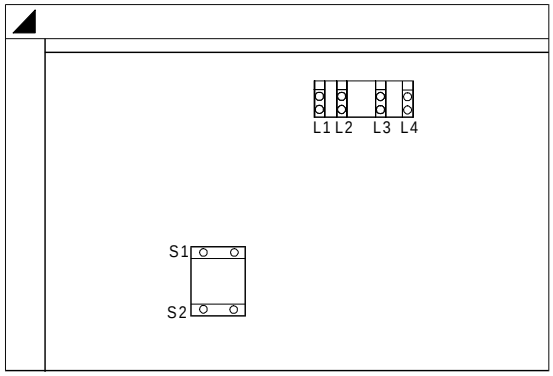
Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
7-801	6	ROM/CPU Version (Printer Control)	Displays the ROM version. **NOTE:** **Class 3 nos, 3, 7, and 8 are used only for the Japanese version.**	
	7	ROM/CPU Version (ANITA)		
	8	ROM/CPU Version (Scanner Control)		
	9	ROM/CPU Version (Stapler)		
7-803*		PM Counter Display	Displays the PM counter after the last PM.	
7-804		PM Counter Reset	Resets the PM counter. *Press down the "Photo mode" key and the # key at the same time to reset the counter.*	**0: No** 1: Yes
7-807		SC/Jam Counter Reset	Resets the SC and jam counters. *Press down the "Photo mode" key and the # key at the same time to reset the counter.*	**0: No** 1: Yes
7-808		Resets Counters (except for the total counter)	Resets the counters except for the following counters: 1. Total counter (SP7-003) 2. PCU counter (SP7-908) 3. Timer counter (SP7-991) *Press down the "Photo mode" key and the # key at the same time to reset the counter.*	**0: No** 1: Yes
7-810		User Code Number Reset	Resets the user code numbers. *Press down the "Photo mode" key and the # key at the same time to reset the counter.*	**0: No** 1: Yes
7-901*		SC History Display	Displays the SC codes that have occurred.	
7-902		SC History Clear	Clears the SC history. *Press down the "Photo mode" key and the # key at the same time to reset the data.*	**0: No** 1: Yes
7-903*		Copy Jam History Display	Displays the copy jams that have occurred.	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
7-904		Copy Jam History Clear	Clears the copy jam history. *Press down the "Photo mode" key and the # key at the same time to reset the data.*	**0: No** 1: Yes
7-905*		Original Jam History Display	Displays the original jams that have occurred.	
7-906		Original Jam History Clear	Clears the original jam history. *Press down the "Photo mode" key and the # key at the same time to reset the data.*	**0: No** 1: Yes
7-907		Timer Counter Clear	Clears the timer counter. *Press down the "Photo mode" key and the # key at the same time to reset the counter.*	**0: No** 1: Yes
7-908		PCU Counter Display	Displays the number of copies that have been made using the current PCU.	
7-909		PCU Counter Clear	**Japanese version only** ***Do not use.***	
7-990		RAM Read	Displays the data in the RAM.	
7-991		Timer Counter Display	Displays the time since the last time that the main switch was turned on.	**0: No** 1: Yes

- APS and Platen/ADF Sensor Output Display (SP4-301) -



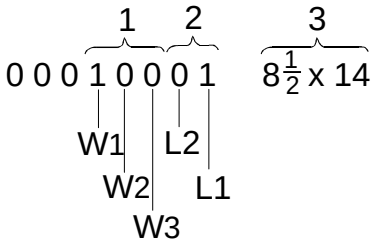
A193M502.wmf



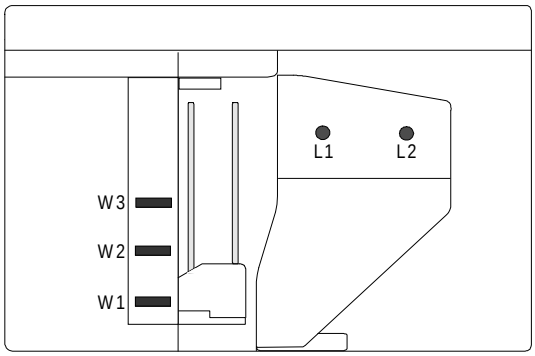
A193M504.wmf

1. Cover sensor status 1 = Closed
2. APS sensor status 1 = Paper detected
3. Paper size display

- DF APS Sensor Output Display (SP6-901) -



A193M503.wmf



A193M500.wmf

1. Original width sensor status 1 = Original detected
2. Original length sensor status 0 = Original detected
3. Paper size

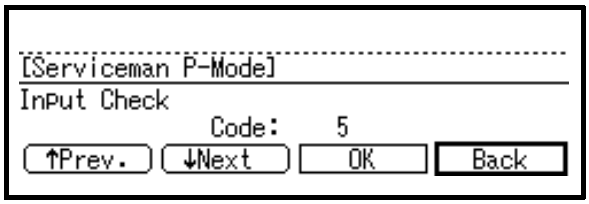
2.2.2 Test Pattern Printing (SP 5-902)

1. Access the SP mode which contains the test pattern you need.
2. Press the Interrupt key on the display to access the copy mode display.
3. Select the required copy features such as paper size, image density, and reproduction ratio.
4. Press the Start key on the operation panel.
5. After checking the test pattern, exit copy mode by pressing the Interrupt key on the operation panel.
6. Press the  key three times to exit the SP mode.

Test Pattern Table for SP5-902

No.	Test Pattern	No.	Test Pattern
0	No Print	16	32 Grayscales (Horizontal)
1	Vertical Lines (single dot)	17	32 Grayscales (Vertical)
2	Horizontal Lines (single dot)	18	32 Grayscales (Vert./Hor.)
3	Vertical Lines (double dots)	19	32 Grayscales (V/H Overlay)
4	Horizontal Lines (double dots)	20	64 Grayscales (Horizontal)
5	Grid Pattern (single dot)	21	64 Grayscales (Vertical)
6	Grid Pattern (double dots)	22	64 Grayscales (Vert./Hor.)
7	Alternating Dot Pattern	23	64 Grayscales (V/H Overlay)
8	Full Dot Pattern	24	16 Grayscales (Horizontal)
9	Black Band	25	16 Grayscales (Vertical)
10	Trimming Area	26	16 Grayscales (Vert./Hor.)
11	Argyle Pattern	27	32 Grayscales (Horizontal)
12	16 Grayscales (Horizontal)	28	32 Grayscales (Vertical)
13	16 Grayscales (Vertical)	29	32 Grayscales (Vert./Hor.)
14	16 Grayscales (Vert./Hor.)	30	64 Grayscales (Horizontal)
15	16 Grayscales (Vert./Hor. Overlay)	31	64 Grayscales (Vertical)
		32	64 Grayscales (Vert./Hor.)

2.2.3 Input Check (SP5-803)



A193M507.wmf

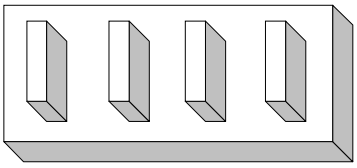
1. Access SP mode 5-803.
2. Select the number which will access the switch or sensor you wish to check (see the following table).
3. Check the status of the sensor or switch.
4. If you wish to check the signal during a copy cycle, select the required copy modes, then press the Start key. After that, re-enter the SP mode to check the next signal.
5. The reading ("0" or "1") will be displayed. The meaning of the display is as follows.

Number	Description	Reading	
		0	1
1	Front Door Safety Switch - +24V	Closed	Opened
2	Front Door Safety Switch - LD5V	Closed	Opened
3	Right Vertical Guide Switch	Closed	Opened
4	Left Vertical Door Sensor	Closed	Opened
5	Left Door Sensor	Closed	Opened
6	Fusing Exit Sensor	Paper not detected	Paper detected
7	Upper Exit Sensor	Paper not detected	Paper detected
8	Lower Exit Sensor	Paper not detected	Paper detected
9	Registration Sensor	Paper not detected	Paper detected
10	Upper Relay Sensor	Paper not detected	Paper detected
11	Charge Roller Contact Sensor	Not home position (Off)	At home position (On)
12	By-pass Feed Paper End Sensor	Paper not detected	Paper detected
13	Upper Tray Paper End Sensor	Paper not detected	Paper detected
14	Lower Tray Paper End Sensor	Paper not detected	Paper detected

Number	Description	Reading	
		0	1
15	Upper Paper Size Sensor	See Table 1	
16	Lower Paper Size Sensor	See Table 1	
17	Main Motor Lock	Not locked	Locked
18	Not used		
19			
20			
21			
22			
23	Upper Paper End Sensor (Optional Paper Tray Unit)	Paper not detected	Paper detected
24	Lower Paper End Sensor (Optional Paper Tray Unit)	Paper not detected	Paper detected
25	Upper Relay Sensor (Optional Paper Tray Unit)	Paper not detected	Paper detected
26	Lower Relay Sensor (Optional Paper Tray Unit)	Paper not detected	Paper detected
27	Upper Paper Size Sensor (Optional Paper Tray Unit)	See Table 1	
28	Lower Paper Size Sensor (Optional Paper Tray Unit)	See Table 1	
29	Tray Cover Switch (Optional Paper Tray Unit)	Closed	Opened
30	Paper Tray Unit Set (Optional Paper Tray Unit)	Not connected	Connected
31	Main Motor Lock (Optional Paper Tray Unit)	Not locked	Locked
32	Upper Tray Upper Limit Sensor (Optional Paper Tray Unit)	Paper not at high position	Paper at high position
33	Lower Tray Upper Limit Sensor (Optional Paper Tray Unit)	Paper not at high position	Paper at high position
34	Not used		
35			
36			
37	Duplex Entrance Sensor (Optional Duplex Unit)	Paper not detected	Paper detected
38	Inverter Unit Set (Optional Duplex Unit)	Not connected	Connected
39	Duplex Unit Set (Optional Duplex Unit)	Not connected	Connected
40	Not used		
41			
42			
43	1-bin Vertical Guide Door Switch (Optional 1-bin Sorter)	Closed	Opened
44	1-bin Sorter Unit Set (Optional 1-bin Sorter)	Not connected	Connected
45	Not used		
46	Not used		
47			
48	Feed Cover Open Sensor (Optional ADF)	Closed	Opened
49	Original Set Sensor (Optional ADF)	Paper not detected	Paper detected
50	DF Position Sensor (Optional ADF)	DF closed	DF opened

Number	Description	Reading	
		0	1
51	Registration Sensor (Optional ADF)	Paper not detected	Paper detected
52	ADF Set (Optional ADF)	Not connected	Connected
53	Not used		
54			
55			
56			
57			
58			
59			
60	Polygonal Mirror Motor Lock	Not locked	Locked
61	Not used		
62	Fusing Unit Set	Not connected	Connected
63	Main Switch	Off	On
64	BiCU Connection	Not connected	Connected
65	Not used		
66	Total Counter Connection	Not connected	Connected
67	Not used		
68	Key Counter Connection	Not connected	Connected
69	Not used		
70			

Table 1: Paper Size Data

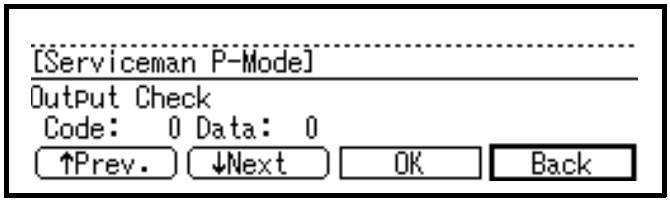


A193M501.wmf

Number	SW 1	SW 2	SW 3	SW 4	SP Value	Paper Size
15,16,27,28	0	0	0	0	0	---
	0	0	0	1	1	A3, F($8_{1/2}$"X13")
	0	0	1	1	3	A4 Sideways
	0	1	0	1	5	A4 Lengthwise
	0	1	1	1	7	A5 Sideways, 11"X17"
	1	0	1	1	11	B4, $8_{1/2}$"X14"
	1	1	0	0	12	* (Asterisk)
	1	1	0	1	13	B5 Sideways, 11"X$8_{1/2}$"
	1	1	1	1	15	B5 Lengthwise, $8_{1/2}$"X11"

1: Pushed

2.2.4 Output Check (SP5-804)



A193M508.wmf

CAUTION: To prevent mechanical or electrical damage, do not keep an electrical component on for a long time.

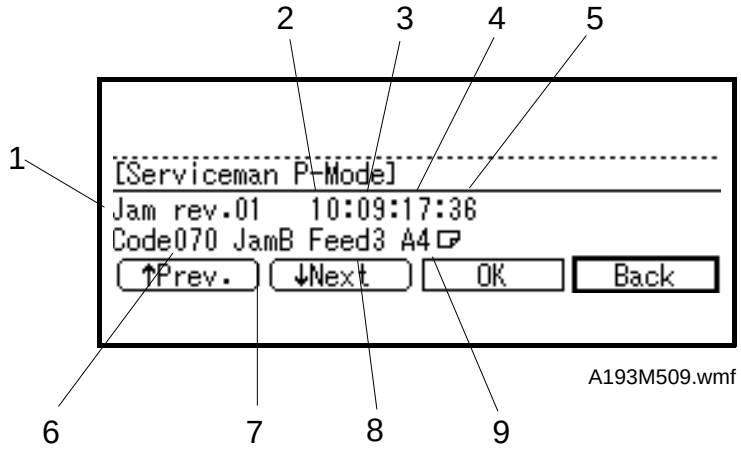
1. Access SP mode 5-804.
2. Select the SP number that corresponds to the component you wish to check (see the following table), then press #.
3. Press "1", then press # to check that component.
4. Exit the SP mode to interrupt the test.
5. If you wish to check another component, re-enter the SP mode.

- Output check table -

No.	Description	No.	Description
1	Junction Gate Solenoid	31	Not used
2	Registration Solenoid	32	
3	Upper Relay Clutch	33	1-bin Junction Gate Solenoid (Optional Sorter)
4	Lower Relay Clutch	34	1-bin Transport Motor (Optional Sorter)
5	Charge Roller Contact Clutch	35	Not used
6	By-pass Feed Clutch	36	
7	Upper Paper Feed Clutch	37	
8	Low Paper Feed Clutch	38	DF Feed Motor (Optional ADF)
9	Development Clutch	39	DF Feed Motor (Power Down) (Optional ADF)
10	Toner Bottle Drive Motor	40	DF Pick-up Solenoid (Optional ADF)
11	Main Motor (Forward)	41	Stamper Solenoid (Optional ADF)
12	Main Motor (Reverse)	42	DF Paper Feed Clutch (Optional ADF)
13	Exhaust Fan	43	Not used
14	Not used	44	
15		45	
16		46	
17		47	
18		48	
19	Upper Paper Feed Clutch (Optional Paper Tray Unit)	49	
20	Lower Paper Feed Clutch (Optional Paper Tray Unit)	50	
21	Upper Relay Clutch (Optional Paper Tray Unit)	51	
22	Lower Relay Clutch (Optional Paper Tray Unit)	52	
23	Main Motor (Optional Paper Tray Unit)	53	Polygonal Mirror Motor
24	Upper Paper Lift Motor (Up) (Optional Paper Tray Unit)	54	Not used
25	Lower Paper Lift Motor (Up) (Optional Paper Tray Unit)	55	
26	Upper Paper Lift Motor (Down) (Optional Paper Tray Unit)	56	
27	Lower Paper Lift Motor (Down) (Optional Paper Tray Unit)	57	
28	Not used	58	
29	Duplex Junction Gate Solenoid (Optional Duplex Unit)	59	
30	Not used	60	

2.2.5 Copy Jam History Display (SP7-903)

After entering the SP mode, select "1" and press the # key. The following message will be displayed.



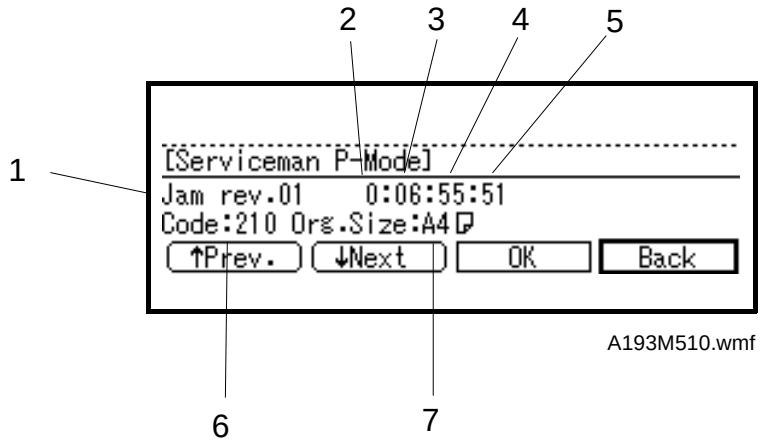
1: Jam history no. 2: Main motor operating date 3: Hour 4: Minute
5: Second 6: Jam code (see the table below) 7: Jam location
8: Paper feed station 9: Paper size

Jam Code	Meaning	Jam Code	Meaning
10	Registration sensor not activated (from paper tray).	120	Lower exit sensor not activated.
11	Relay sensor not activated.	121	Lower exit sensor remained activated by paper
30	Upper relay sensor (Optional PTU) not activated.	122	Upper exit sensor not activated.
31	Lower relay sensor (Optional PTU) not activated.	123	Upper exit sensor remained activated by paper
50	Registration sensor not activated (from by-pass feed)	124	Duplex exit sensor not activated.
70	Registration sensor remained activated by paper	125	Duplex exit sensor remained activated by paper
90	Fusing exit sensor not activated	150	Paper sensor (Optional 1-bin sorter) does not detect paper.
100	Duplex entrance sensor not activated		

NOTE: The NVRAM can store data for up to 10 copy jams. If more than 10 copy jams occur, the oldest data will be erased.

2.2.6 Original Jam History Display (SP7-905)

After entering the SP mode, select "1" and press the # key. The following message will be displayed.



1: Jam history no. 2: Main motor operating date 3: Hour 4: Minute
5: Second 6: Jam code (see the table below) 7: Original size

Jam Code	Meaning
210	Registration sensor not activated.
211	The registration sensor remained activated by paper.

NOTE: The NVRAM can store data for up to 10 original jams. If more than 10 original jams occur, the oldest data will be erased.

2.2.7 System Parameter And Data Lists (SP5-992)

1. Access SP mode 5-992 and select the number corresponding to the list that you wish to print.
2. Press the Interrupt key on the operation panel to access the copy mode display.
3. Select the paper size.
4. Press the Start key on the operation panel to print the list.
5. After printing the list, exit copy mode by pressing the Interrupt key on the operation panel.
6. Press the ⌧/C key three times to exit the SP mode.

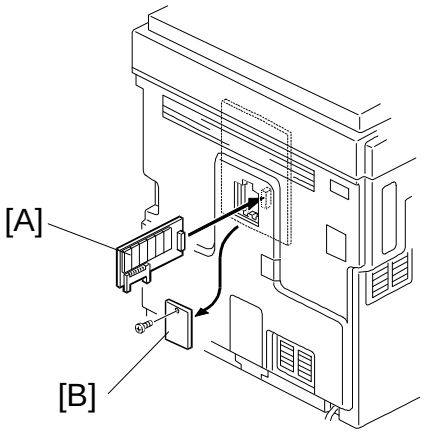
2.2.8 Memory All Clear (SP5-801)

CAUTION: Memory All Clear mode resets all the settings stored in the NVRAM to their default settings. Among these settings are the correction data for process control and all the software counters. Normally, this SP mode should not be used. This procedure is required only after replacing the RAM board or when the copier malfunctions due to a damaged RAM board.

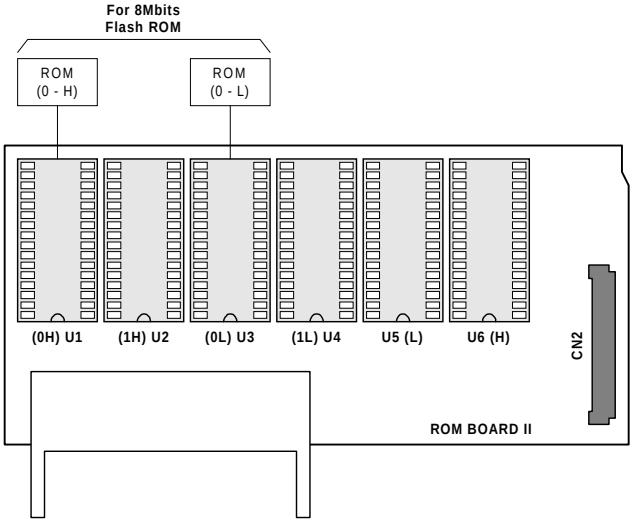
1. Print out all System Parameter Lists (SP mode 5-992).
2. Enter SP mode 5-801.
3. Hold the "Photo Mode" key and # at the same time.
   (If the all memory clear was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice.)
4. Turn the main switch off and back on.
5. Do the printer and scanner registration and magnification adjustments (see section 11 of Replacement and Adjustment).
6. Referring to the system parameter list, re-enter any values which had been changed from their factory settings. In particular, the values for SP4-904, SP4-905, SP4-906, and SP4-907 must be re-entered.
7. Do the standard white level adjustment (SP 4-908). See Replacement and Adjustment - White Level Adjustment for details.
8. Check the copy quality and the paper path, and do any necessary adjustments.

2.2.9 Program Download

This procedure copies the software from an ROM board to the Flash ROM on the BICU board.



A193M514.wmf



A193M513.wmf

1. Turn off the main and ac switches.
2. When the new software is downloaded from an ROM board [A], mount the ROMs on the correct ROM sockets as shown above.
3. Remove the ROM cover [B].
4. Plug the ROM board into the connector on the BICU board.
5. Turn on the ac and main switches, access SP5-932, select YES, and press the # key.
6. After completing the download, turn off the ac and main switches, then remove the ROM board.

3. USER PROGRAM MODE

The user program (UP) mode is accessed by users and key operators, and by sales and service staff. UP mode is used to input the copier's default settings.

3.1 HOW TO ENTER AND EXIT UP MODE

Press the User Tools button, then select the UP mode program. After selecting the UP mode program, press the User Tools button to exit UP mode.

UP Mode Table (System Settings)

System	**1. Function Priority**	
	2. Clear Function Setting	
	3. Panel Beeper	
	4. Copy Count Display	
	5. Auto Reset	1. System Auto Reset
		2. Copy Reset
		3. Fax Reset
		4. Printer Reset
	6. Function Timeout	
	7. Auto Energy Saver	
	8. Energy Save Mode	
	9. Auto Shut Off	
	10. Special Paper Size	
	11. Paper Tray Priority	
	12. Auto Tray Switch	
	13. By-pass Auto Select	
	14. Output Tray	1. Copier
		2. Fax
		3. Printer
	15. Simultaneous Print	
	16. Contrast	
	17. Set User Codes	1. Copy User Codes
		2. Fax User Codes
		3. Printer User Codes
	18. Restricted Access	1. Reset Counters
		2. Register User Codes
		3. Change/Delete User Codes
		4. Key Operator Code
		5. Register/Change Key Operator Code
		6. Copier Access
		7. Fax Access
		8. Printer Access

UP Mode Table (Copy Settings)

Copy	**1. General Features**	1. APS Priority
		2. AID Priority
		3. Original Priority
		4. Show All Keys
		5. Maximum Copy Q'ty
		6. Original Beeper
		7. Photo Mode
	2. Adjust Image	1. Erase Border
		2. Erase Center
		3. Left Duplex Margin
		4. Top Duplex Margin
		5. Double Copy Separation Line
		6. Combine/Image Repeat Separation Line
	4. Input/Output	1. Duplex Auto Eject
		2. Combine Auto Eject
		3. Original Count
		4. SADF Auto Reset
		5. ADF Auto Sort
		6. Rotate Sort
		7. Rotate Sort Auto Paper Continue

4. SWITCHES/LEDS

4.1 SWITCHES

BICU

Number	Function
SW 1	Resets all systems (like turning the main switch off/on).

4.2 LEDS

BICU

Number	Function
LED 1	Monitors the +5V line for the slave CPU (IC5). Usually, this LED is blinking.
LED 2	Monitors the +5V line. Usually, this LED is lit.

IOCSS

Number	Function
D103	Monitors the connection between the IOCSS and the BICU. Usually, this LED is lit.

4.3 TEST PIN

IOCSS

Number	Monitored Signal
TP105	Monitors the control voltage of the TD sensor (Vcont).

5. SPECIAL TOOLS AND LUBRICANTS

5.1 SPECIAL TOOLS

Part Number	Description	Q'ty
A006 9104	Scanner Positioning Pin (4 pcs/set)	1
A193 9351	ROM Board 2	1
A193 9535	Flash ROM/SRAM Copy Tool 2	1
A153 9004	Wiping Cloth (for the Drum Charge Roller)	1
5420 9516	Test Chart - OS-A3 (10 pcs/set)	1
5420 9507	Digital Multimeter	1

SECTION 5

PREVENTIVE MAINTENANCE

1. PREVENTIVE MAINTENANCE SCHEDULE

1.1 PM TABLE

NOTE: The amounts mentioned as the PM interval indicate the number of prints.

Symbol key: C: Clean, R: Replace, L: Lubricate, I: Inspect

A193	EM	100K	200K	300K	NOTE
SCANNER/OPTICS					
Reflector		C	C	C	Optics cloth
1st Mirror		C	C	C	Optics cloth
2nd Mirror		C	C	C	Optics cloth
3rd Mirror		C	C	C	Optics cloth
Scanner Guide Rails		C	C	C	Do not use alcohol.
Platen Sheet Cover	C	I	I	I	Replace the platen sheet, if necessary. Dry cloth or alcohol
Exposure Glass		C	C	C	Dry cloth or alcohol
Toner Shield Glass		C	C	C	Optics cloth
APS Sensor		C	C	C	Dry cloth or alcohol
AROUND THE DRUM					
Transfer Roller		R	R	R	To clean, use a blower brush.
Quenching Lamp		C	C	C	Dry cloth
PAPER FEED					
Registration Roller		C	C	C	Clean with water or alcohol.
Paper Feed Roller (By-pass feed table)	C	C	C	C	Clean with water or alcohol.
Registration Mylar		C	C	C	Clean with water or alcohol.
Relay Rollers		I	I	I	Clean/replace if necessary
Paper Feed Guides		C	C	C	Clean with water or alcohol.
Paper Feed Rollers		R	R	R	
Bottom Plate Pad		C	C	C	Clean with water or alcohol.
Bottom Plate Pad (By-pass feed)		C	C	C	Clean with water or alcohol.
FUSING UNIT					
Fusing Entrance and Exit Guide Plates		C	C	C	Clean with water or alcohol.
Hot Roller		R	R	R	
Pressure Roller		R	R	R	
Fusing Thermistor		I	I	I	Clean if necessary
Cleaning Roller		C	C	C	Clean with water or alcohol.
Cleaning Roller Bushings		C	C	C	Alcohol
Hot Roller Strippers		R	R	R	
Hot Roller Bushing		R	R	R	

A193	EM	100K	200K	300K	NOTE
OTHERS					
Drive Belts		I	I	I	Replace if necessary

	EM	60K	120K	185K	240K	NOTE
AUTO DOCUMENT FEEDER		(for originals)				
Transport Belt	C	R	R	R	R	Alcohol
Separation Roller	C	R	R	R	R	Alcohol
Pick-up Roller	C	R	R	R	R	Alcohol
Stamper	I					Replace if necessary
White Plate	C					Alcohol
DF Exposure Glass	C					Alcohol
Platen Cover	C					Alcohol

PAPER TRAY UNIT	EM	100K	200K	300K	400K	NOTE
Paper Feed Rollers			R		R	
Relay Rollers			C		C	Dry or damp cloth
Relay Driven Rollers			C		C	Dry or damp cloth
Bottom Plate Pads			C		C	Dry or damp cloth
Relay Clutches			I		I	Replace if necessary
Paper Feed Clutches			I		I	Replace if necessary

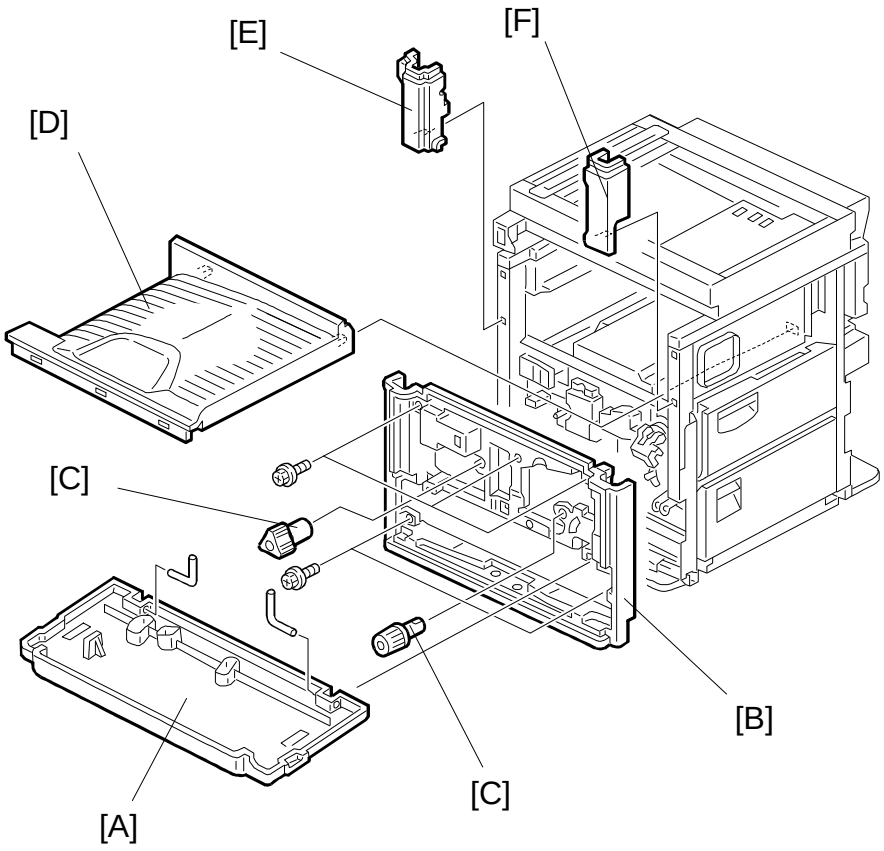
DUPLEX TRAY	EM		NOTE
Paper Feed Roller	C		Damp cloth
Transport Rollers	C		Damp cloth
Inverter Rollers	C		Damp cloth

SECTION 6

REPLACEMENT AND ADJUSTMENT

1. EXTERIOR

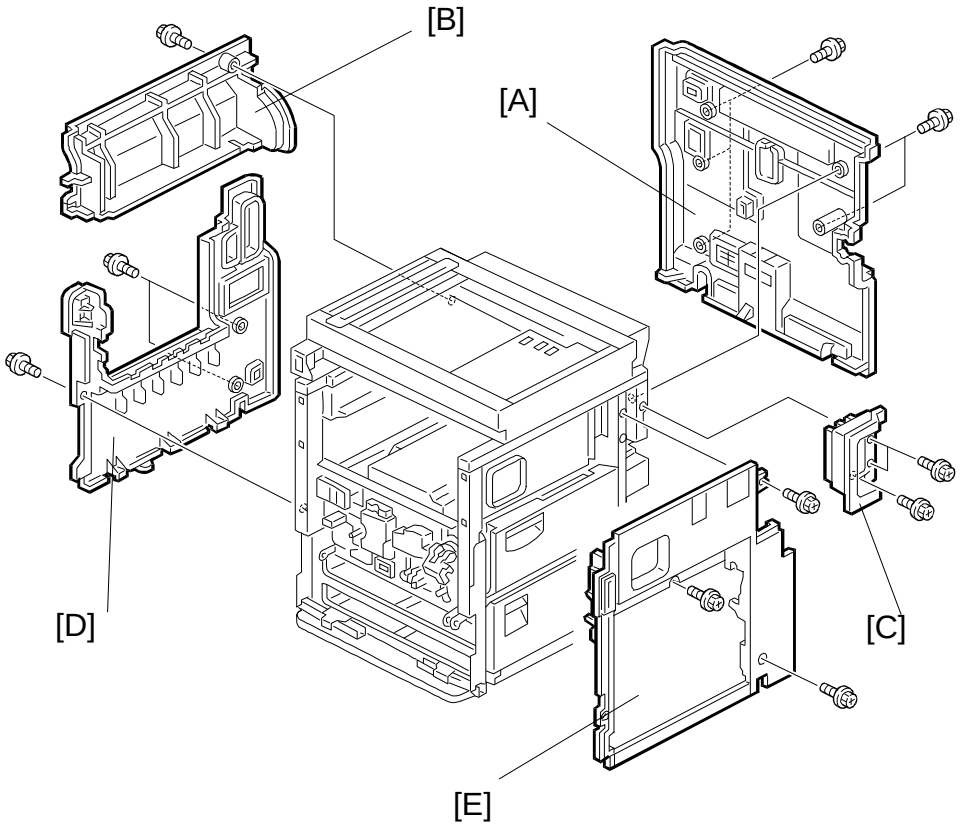
1.1 FRONT COVER/INNER COVER



A193R001.wmf

1. Open the front cover [A].
2. Remove the front cover (2 pins).
3. Remove the inner cover [B] (2 knobs [C], 6 screws and 1 screw if the optional paper tray unit is installed).
4. Remove the copy tray [D].
5. Remove the front left cover [E] and front right cover [F].

1.2 REAR COVER



A193R002.wmf

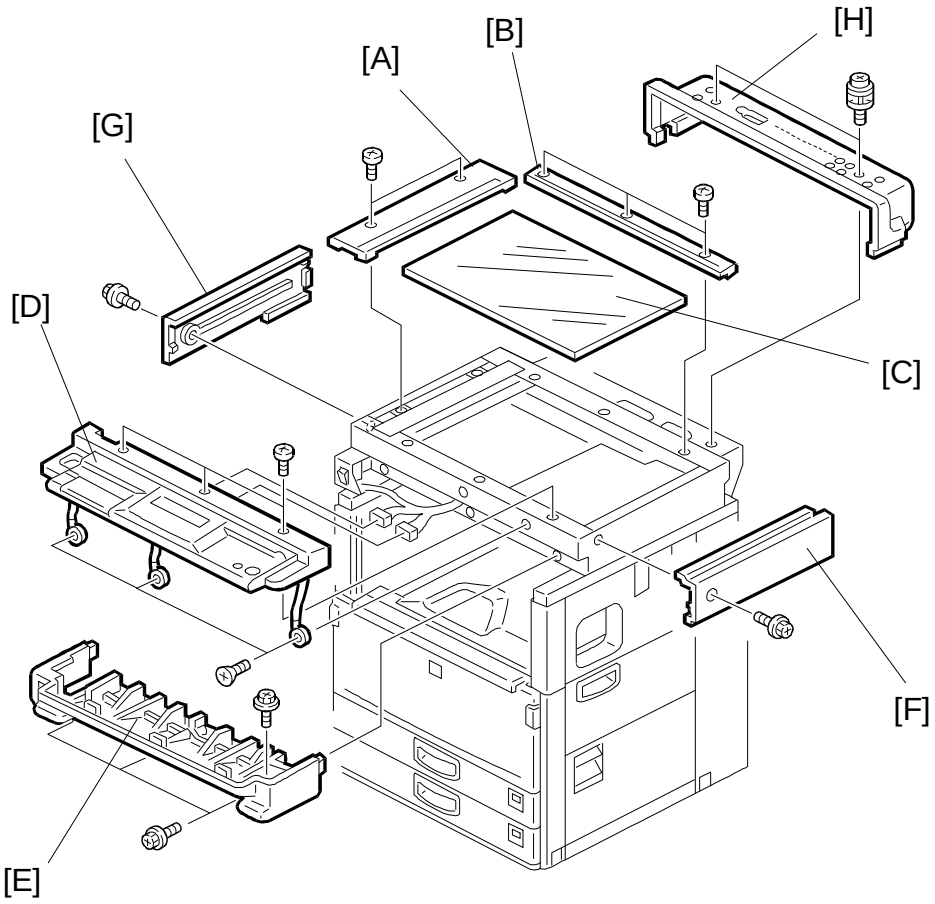
CAUTION: If the machine is equipped with a DF and a paper tray unit, disconnect the cable which connects the copier with the DF and the paper tray unit, before removing the rear cover.

1. Remove the rear cover [A] (6 screws).
2. Remove the upper left cover [B] (1 screw) and the upper right cover [C] (3 screws).

1.3 LEFT/RIGHT COVER

1. Remove the front cover, inner cover, rear cover, upper left cover, and upper right cover.
2. Remove the left cover [D] (4 screws) and right cover [E] (3 screws).

1.4 EXPOSURE GLASS/OPERATION PANEL/UPPER COVER



A193R003.wmf

1. Remove the left scale [A] and rear scale [B] (5 screws).
2. Remove the exposure glass [C].
3. Remove the operation panel [D] (6 screws).

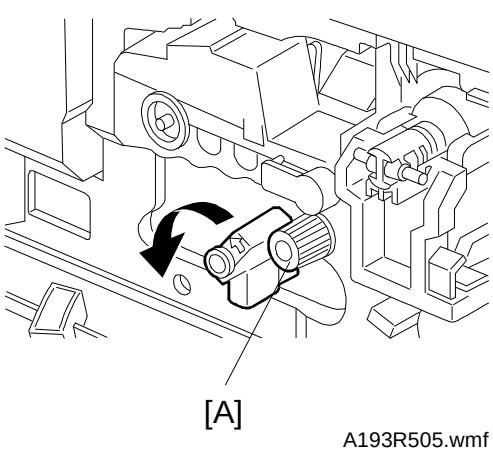
   NOTE: When reinstalling the operation panel, connect the grounding terminal [E] so that the wire is vertical.
4. Remove the operation lower cover [F] (4 screws).
5. Remove the scanner right cover [G] (1 screw).
6. Remove the scanner left cover [H] (1 screw).
7. Remove the scanner rear cover [I].

2. PHOTOCONDUCTOR UNIT (PCU)

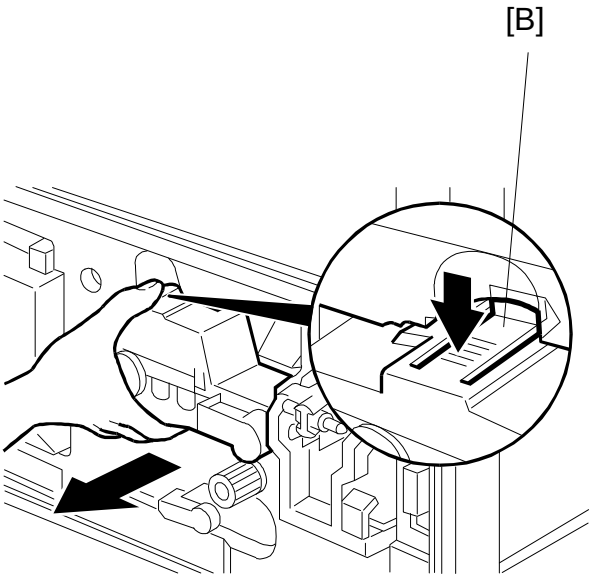
⚠ WARNING

Do not incinerate the photoconductor unit. Toner dust might ignite when exposed to an open flame. Dispose of the used photoconductor unit in accordance with local regulations for plastics.

2.1 PCU



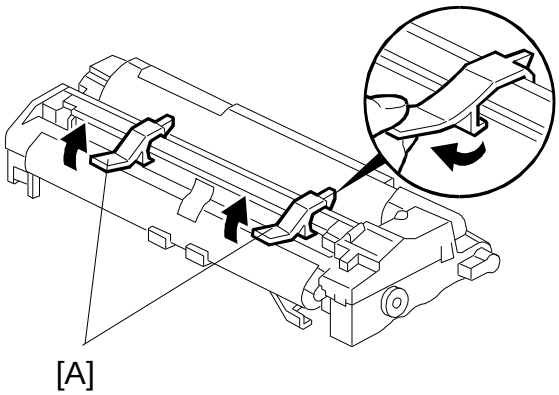
A193R505.wmf



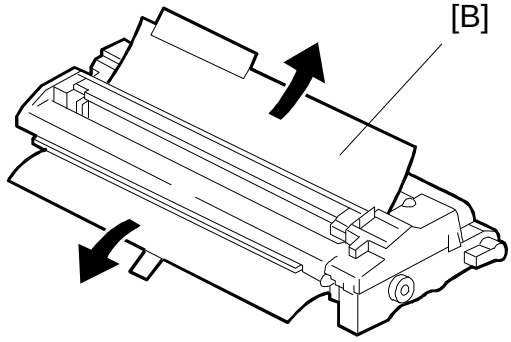
A193R506.wmf

1. Turn the lever [A] to the left to release the transfer unit. Then, pull the PCU out slightly, while pushing the release lever [B] to unlock the PCU.
2. Pull the PCU out until it stops.
3. Hold the PCU with both hands. Slightly tilt the PCU to the left and right to unlock it. Then, pull the PCU out.

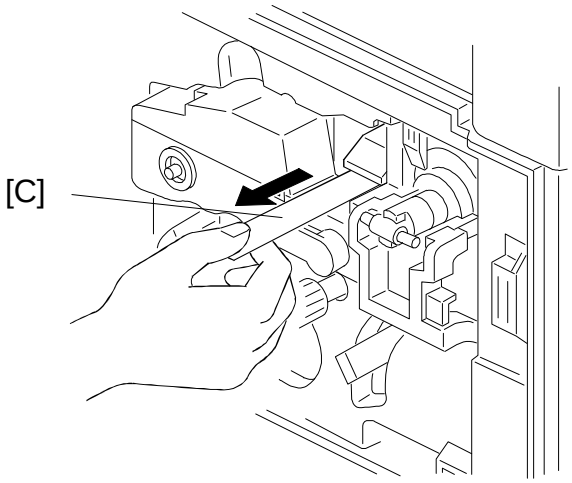
   NOTE: Do not tilt the used PCU after removing it from the machine, to prevent toner spillage.



A193R508.wmf



A193R509.wmf



A193I502.wmf

4. Remove the 2 clamps [A] and the drum protection sheet [B] from the new PCU.

   NOTE: Do not touch the photoconductor. If you do, copy quality may be abnormal.

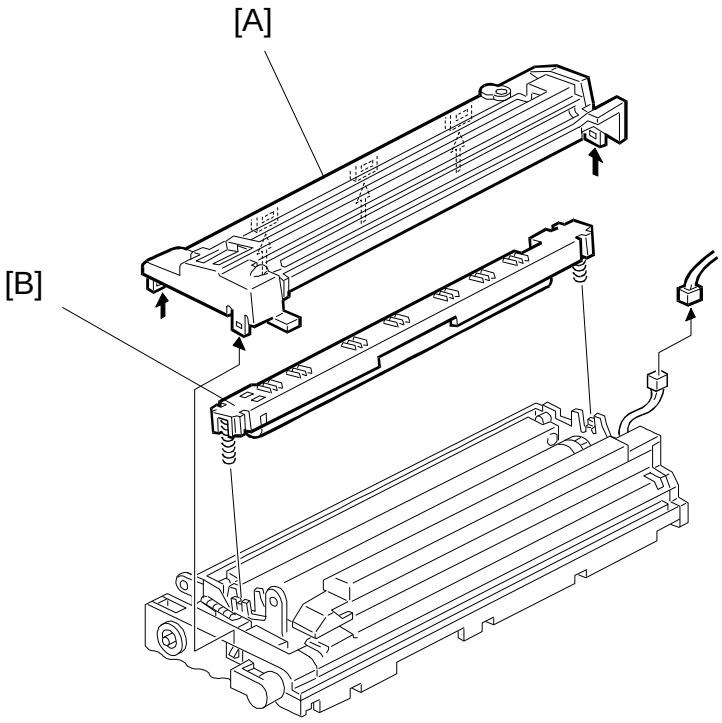
5. Insert the new PCU into the machine. Push the new PCU until the release lever locks.

6. Peel the sealing tape [C] off gently.

7. Return the lever to its original position (see lever [A] on the previous page).

   NOTE: After replacing the PCU, the machine will take about 2 minutes to warm up. During this warm-up period, do not open the front cover or turn off the ac and main switches or a fault may occur.

2.2 DRUM CHARGE ROLLER UNIT

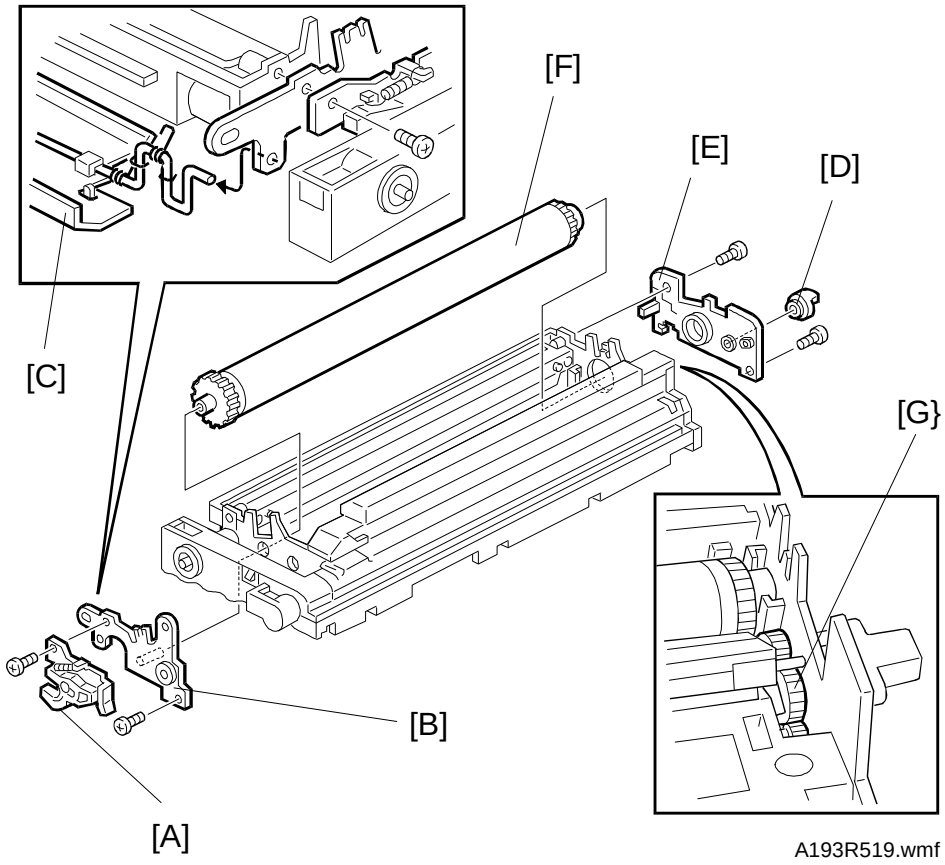


A193R525.wmf

1. Remove the upper cover [A] of the PCU (6 hooks).
2. Remove the drum charge roller unit [B].

NOTE: 1. Do not let the springs fall. Do not remove the drum charge roller from the case when cleaning or replacing.
2. Never touch the surface of the drum charge roller.
3. If there is any dirt on the surface of the drum charge roller, wipe it off with a dry cloth or a special cloth for the drum charge roller. (The special cloth is available as a service part: A1539004.) **Never use alcohol or water to clean the drum charge roller.**

2.3 DRUM



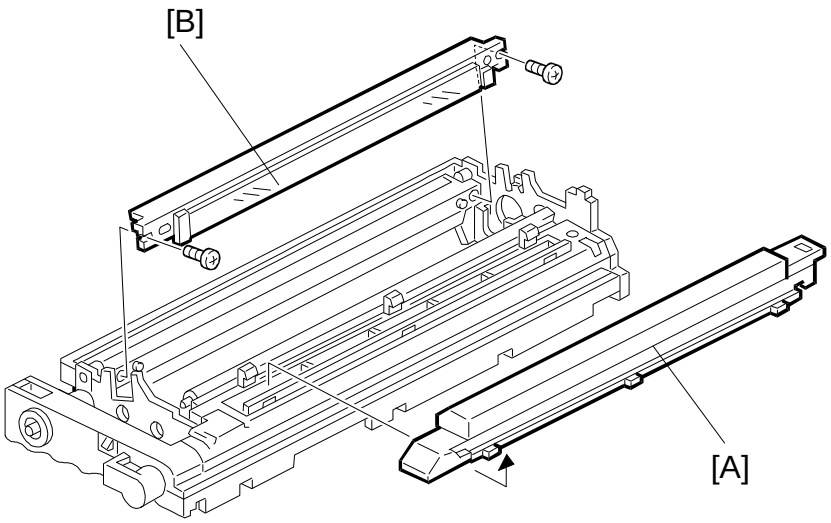
A193R519.wmf

1. Remove the drum charge roller unit. (See Drum Charge Roller Unit.)
2. Remove the shutter cam [A] (1 screw) and the front plate [B] (1 screw).
3. Remove the shutter [C].
4. Remove the joint [D] and rear plate [E] (2 screws).
5. Remove the drum [F].

NOTE: Do not touch the drum surface with bare hands.

CAUTION: Be careful not to spill toner over the train of gears [G] when removing the front or rear plate. Otherwise, development roller torque is likely to increase.

2.4 CLEANING BLADE

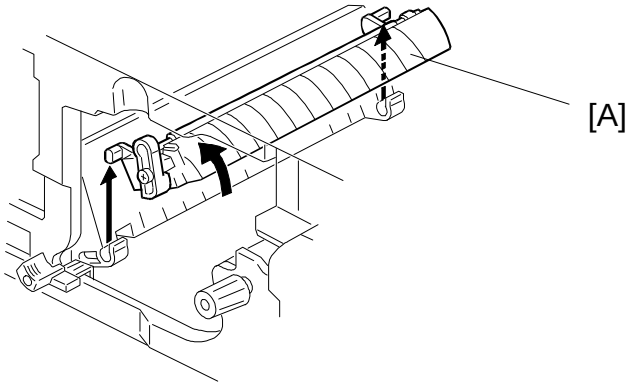


A193R008.wmf

1. Remove the drum. (See Drum.)
2. Remove the developer cartridge [A] (3 hooks).
3. Remove the cleaning blade [B] (2 screws).

3. TRANSFER UNIT

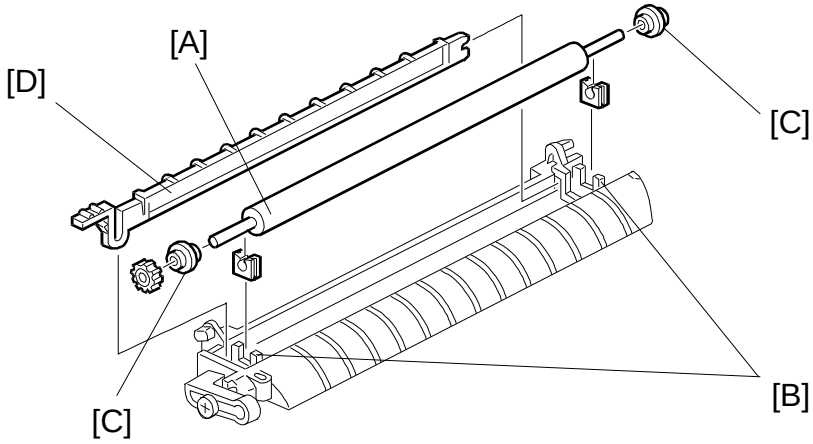
3.1 TRANSFER UNIT



A193R009.wmf

1. Remove the PCU.
2. Raise the transfer unit [A] vertically and remove it.

3.2 TRANSFER ROLLER/SEPARATION UNIT



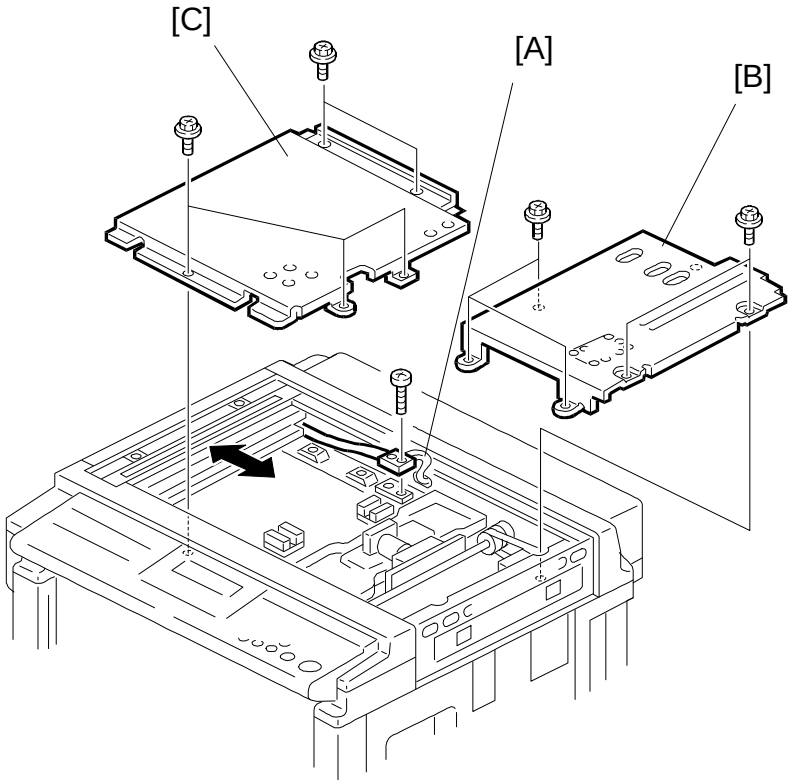
A193R010.wmf

1. Remove the transfer unit. (See Transfer Unit.)
2. Remove the transfer roller [A].

   NOTE: 1) Clean the bushings [B] and pulleys [C]. When replacing the transfer roller, replace the bushings and pulleys together.
   2) Do not touch the surface of the transfer roller with bare hands. When cleaning the transfer roller, use a blower brush, not a cloth.
3. Remove the discharge brush [D].

4. SCANNER UNIT

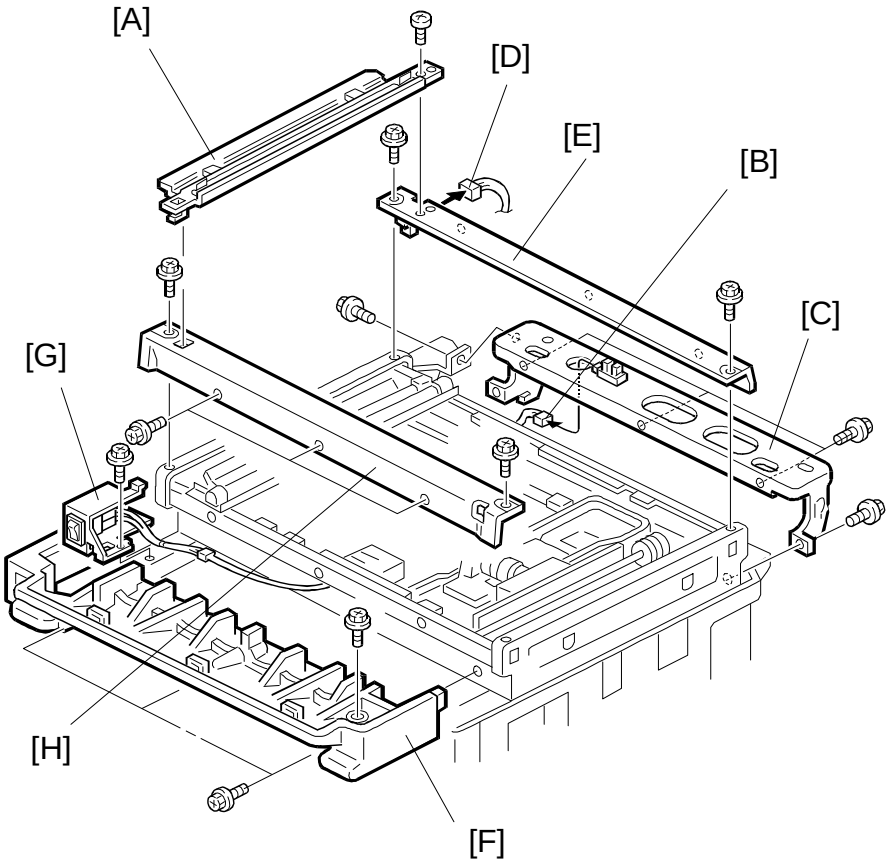
4.1 LENS COVER



A193R011.wmf

1. Remove the scales and exposure glass. (See Exposure Glass/Operation Panel/Upper Cover.)
2. Remove the flat cable [A] (1 screw).
3. Remove the right lens cover [B] (5 screws) and left lens cover [C] (5 screws).

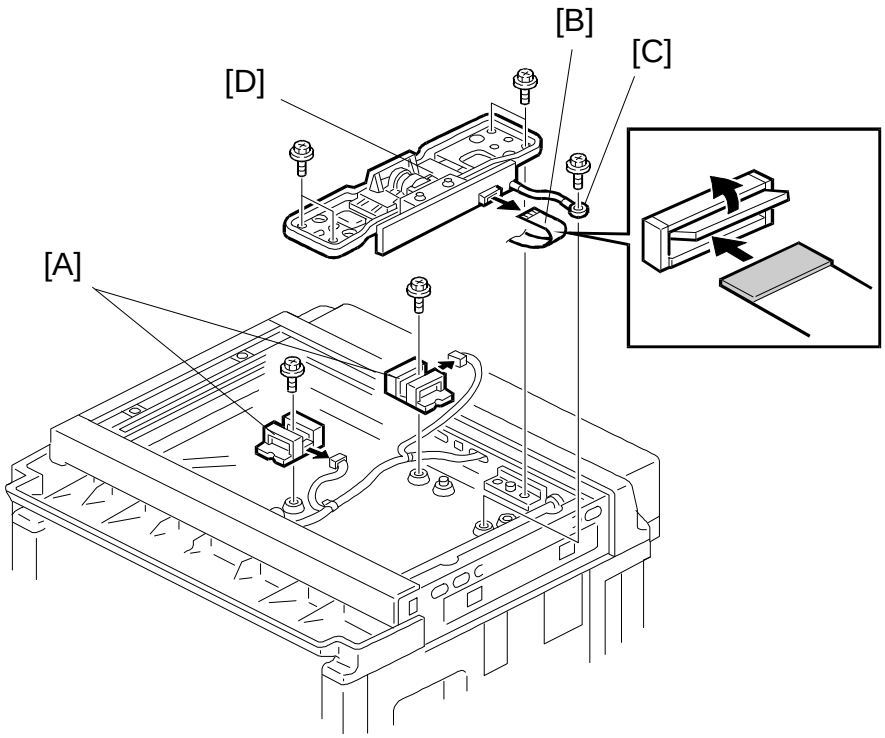
4.2 SCANNER FRAME



A193R523.wmf

1. Remove the platen cover (ADF).
2. Remove all parts indicated in the Exposure Glass/Operation Panel/Upper Cover section.
3. Remove the exposure glass bracket [A] (1 screw).
4. Disconnect the platen cover sensor [B] and remove the lower rear scanner frame [C] (6 screws).
5. Disconnect the scanner H.P. sensor [D] and remove the upper rear scanner frame [E] (2 screws).
6. Remove the lower operation panel [F] (3 screws).
7. Remove the main switch bracket [G] (1 screw).
8. Remove the front scanner frame [H] (5 screws).

4.3 ORIGINAL SIZE SENSOR



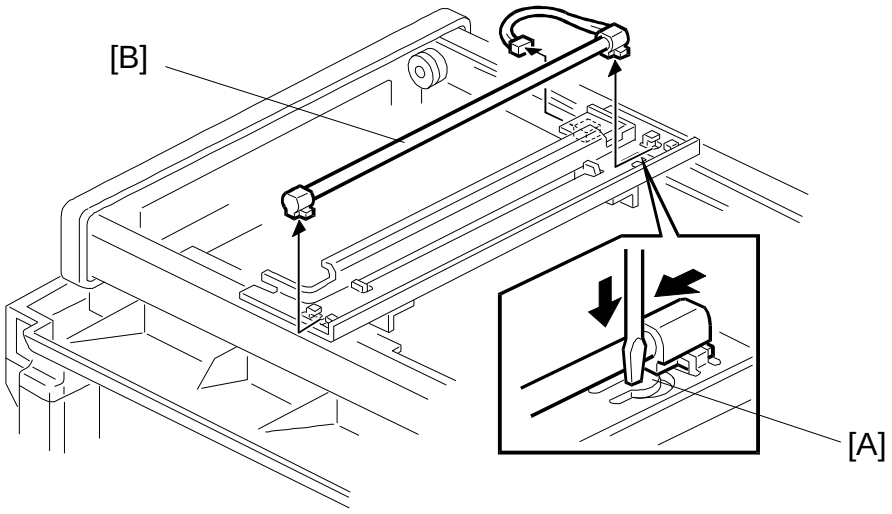
A193R013.wmf

1. Remove the exposure glass. (See Exposure Glass/Operation Panel/Upper Cover.)
2. Remove the lens covers. (See Lens Cover.)
3. Change the original size sensors [A]: two for 115 V machines and three for 230 V machines (2 screws each).

4.4 LENS BLOCK/SBU ASSEMBLY

1. Remove the exposure glass and operation panel. (See Exposure Glass/Operation Panel/Upper Cover.)
2. Remove the lens covers. (See Lens Cover.)
3. Disconnect the flexible harness [B].
4. Remove the grounding wire [C].
5. Remove the lens block [D] (4 screws).
6. Do the scanner and printer copy adjustments in section 11.

4.5 XENON LAMP

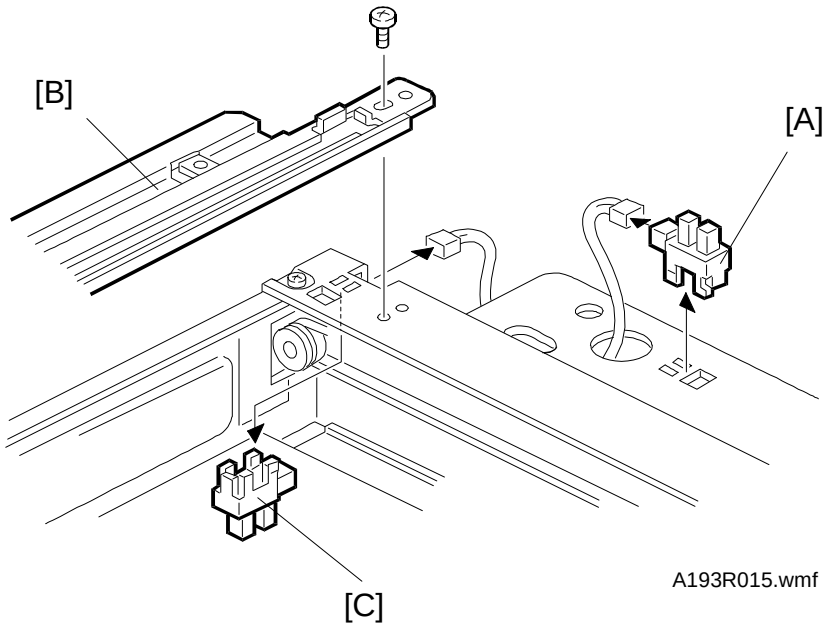


A193R014.wmf

1. Remove the exposure glass and operation panel. (See Exposure Glass/Operation Panel/Upper Cover.)
2. Remove the scanner frames. (See Scanner Frame.)
3. Press the lamp holder [A] down with a driver, as shown.
4. Slide the xenon lamp [B] forward and remove it (1 connector).

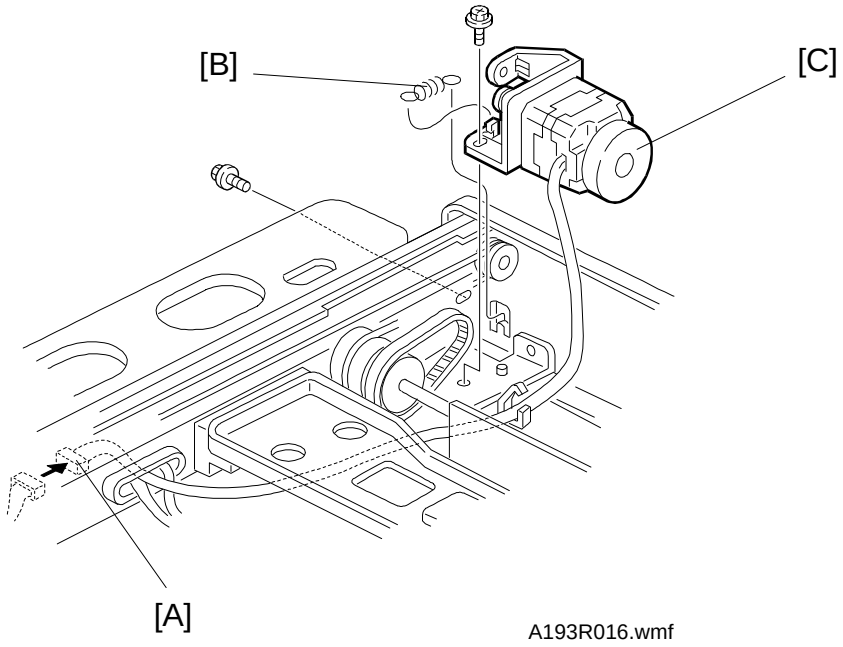
   NOTE: Do not touch the glass surface of the xenon lamp with fingers.
5. After placing the new lamp, press the lamp holder up to the original position so that it could hold the lamp properly.

4.6 SCANNER H. P. SENSOR/PLATEN COVER SENSOR



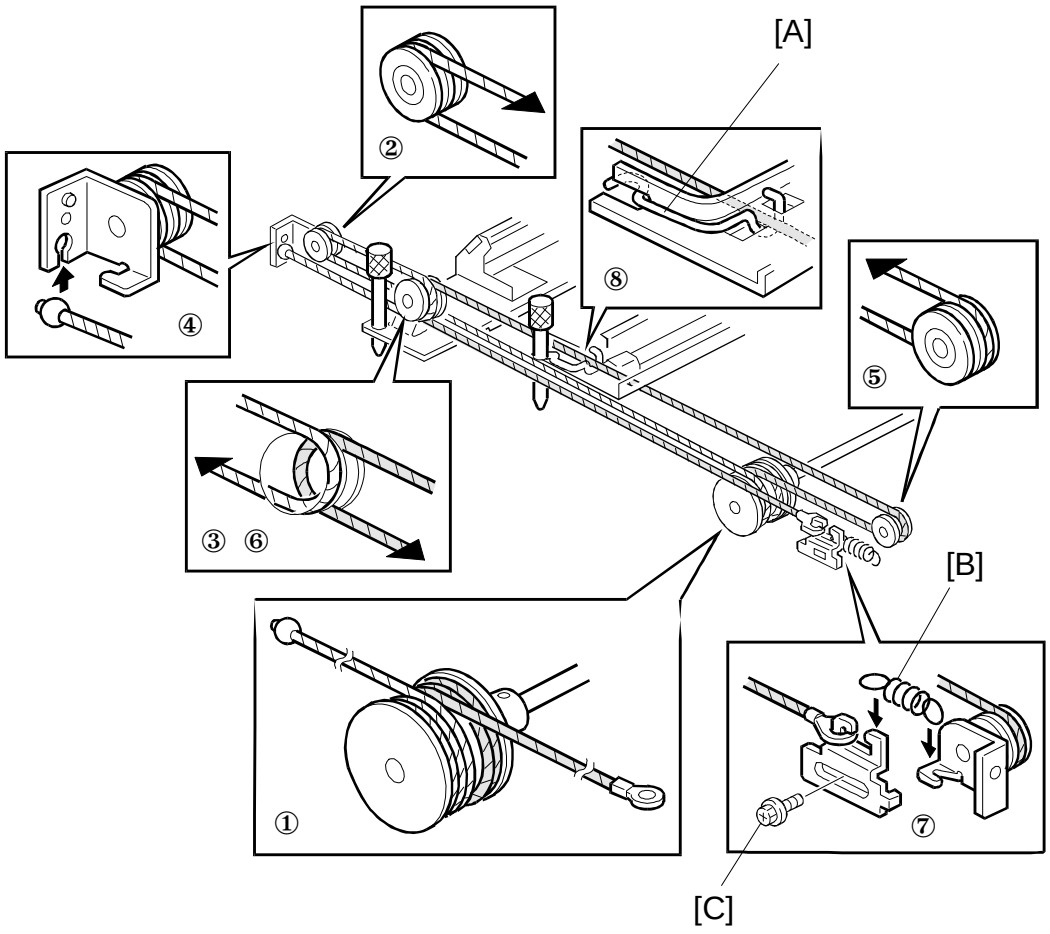
1. Remove the exposure glass and upper rear cover. (See Exposure Glass/Operation Panel/Upper Cover.)
2. Replace the platen cover sensor [A] (1 connector).
3. Remove the scale bracket [B] (1 screw) and replace the scanner H.P. sensor [C].

4.7 SCANNER MOTOR



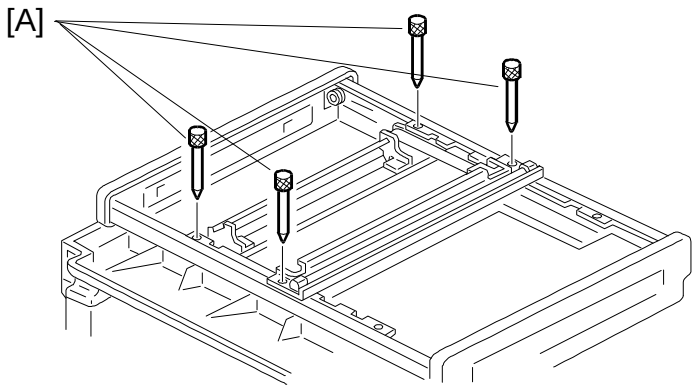
1. Remove the exposure glass and operation panel. (See Exposure Glass/Operation Panel/Upper Cover.)
2. Remove the lens covers. (See Lens Cover.)
3. Remove the scanner frames. (See Scanner Frame.)
4. Remove the harness [A].
5. Remove the tension spring [B].
6. Remove the motor bracket [C] (2 screws).
7. Secure the new motor with the tension spring.
8. Do the scanner and printer copy adjustments in section 11.

4.8 SCANNER WIRE



A193R520.wmf

1. Remove the exposure glass and operation panel. (See Exposure Glass/Operation Panel/Upper Cover.)
2. Remove the lens covers. (See Lens Cover.)
3. Remove the scanner frames. (See Scanner Frame.)
4. Remove the pin [A] securing the 1st scanner and remove the 1st scanner.
5. Remove the spring [B].
6. Loosen the screw [C] securing the wire tension bracket. Loosen the screw at the opposite side.
7. Remove the scanner wire.
8. Wind the new scanner wire on the pulley in the correct direction as shown.



A193R018.wmf

9. Wind the end of the new wire with a ball as shown in illustrations ② - ④ on the previous page.
10. Wind the end of the new wire with a ring as shown in illustrations ⑤ - ⑦ on the previous page.
11. Secure the screw of the wire tension bracket, with the wire tension spring pulled as shown in illustration ⑦ on the previous page.
12. Install the 1st scanner and adjust its position with the scanner positioning tools (P/N A0069104) [A]. Then clamp the 1st scanner with the scanner positioning pin as shown in illustration ⑧ on the previous page.
13. Remove the positioning tools. After sliding the scanner to the left and right several times, set the scanner positioning tools to check the clamp position and wire tension bracket position again.
14. Do the scanner and printer copy adjustments in section 11.

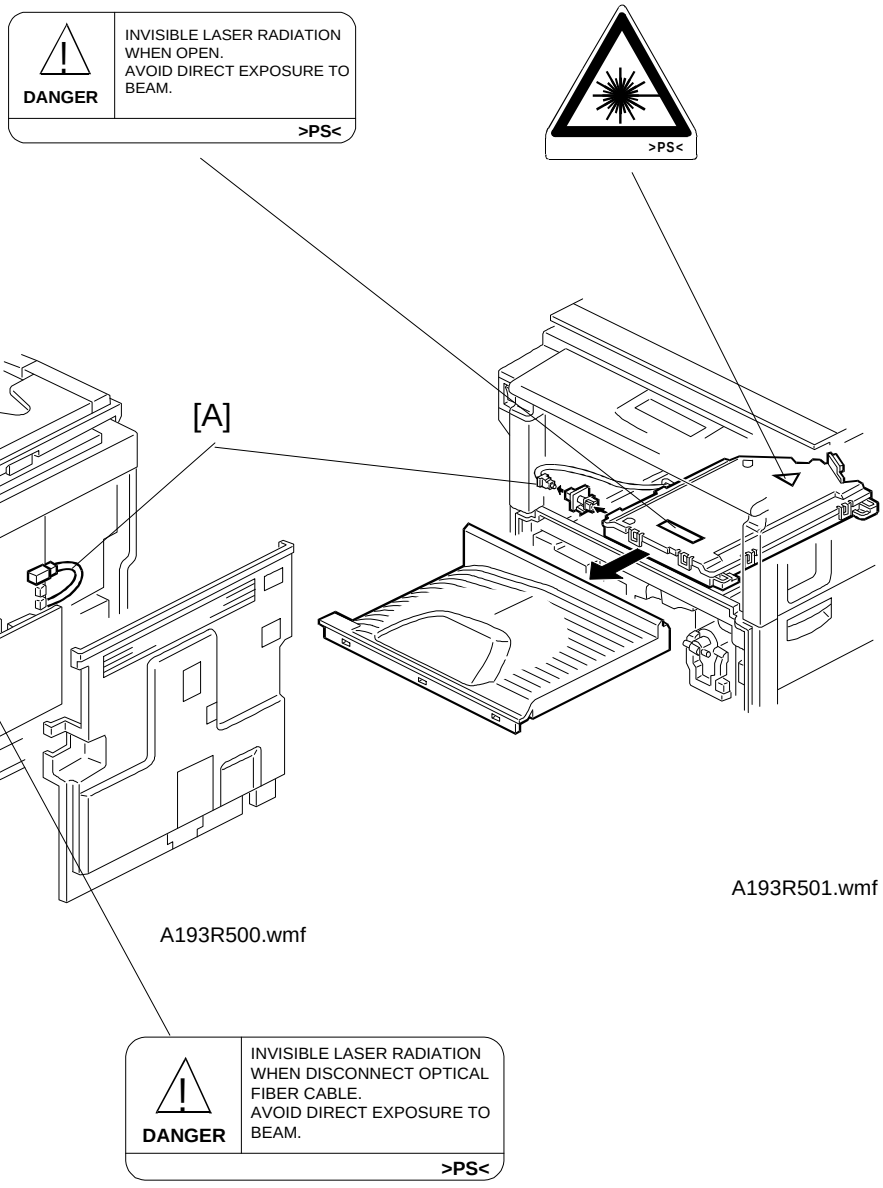
5. LASER UNIT

⚠ WARNING

Turn off the main switch and unplug the machine before attempting any of the procedures in this section. Laser beams can seriously damage your eyes.

- CAUTION DECALS -

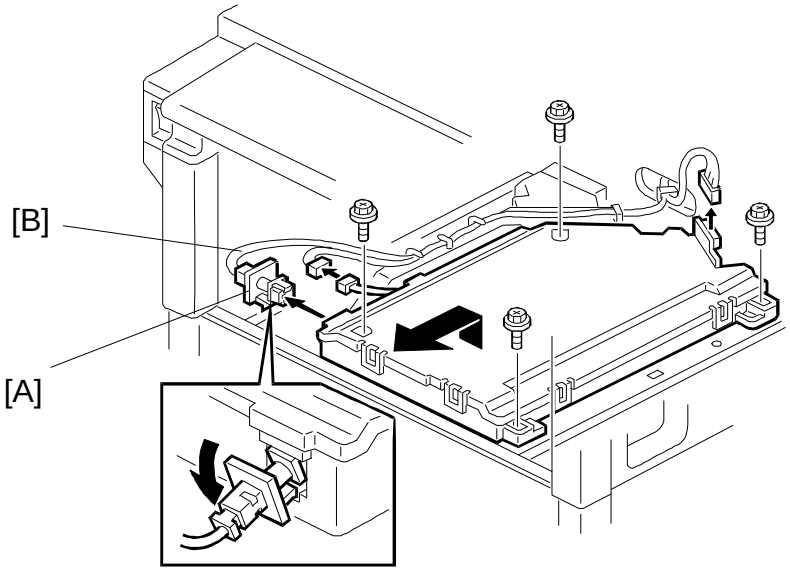
Three caution decals and the optical fiber cable [A] are located in the laser section as shown below.



A193R501.wmf

A193R500.wmf

5.1 LASER UNIT/MAIN SCAN SYNCHRONIZATION DETECTOR



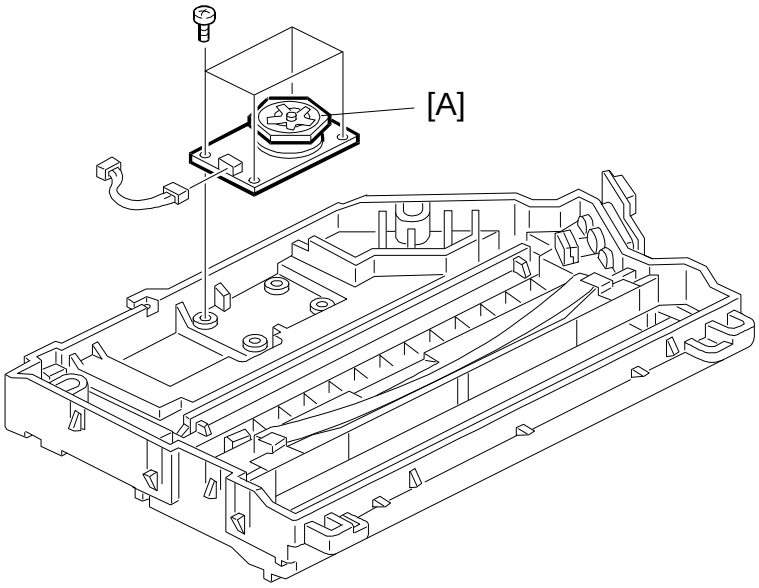
A193R504.wmf

⚠ WARNING

Turn off the main switch and unplug the machine before attempting any of the procedures in this section. Laser beams can seriously damage your eyes.

1. Remove the copy tray.
2. Remove the main scan synchronizing detector [A].
3. Disconnect the optical fiber cable [B].
4. Remove the laser unit (4 screws and 1 connector).

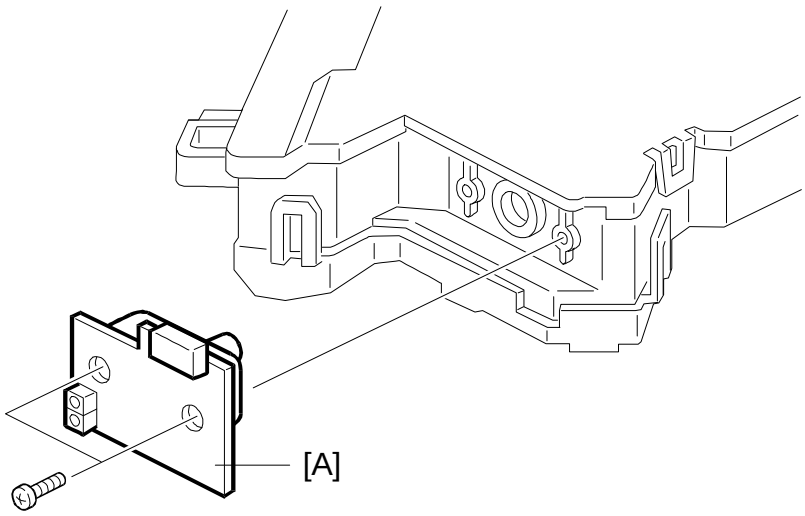
5.2 POLYGON MIRROR MOTOR



A193R502.wmf

1. Remove the front cover, inner cover, copy tray, and the front left and right covers (see section 1.1)
2. Remove the copy tray.
3. Remove the main scan synchronizing detector.
4. Remove the laser unit (4 screws, 2 connectors).
5. Remove the laser unit cover.
6. Remove the polygon mirror motor [A] (4 screws, 1 connector).
7. Do the scanner and printer copy adjustments in section 11.

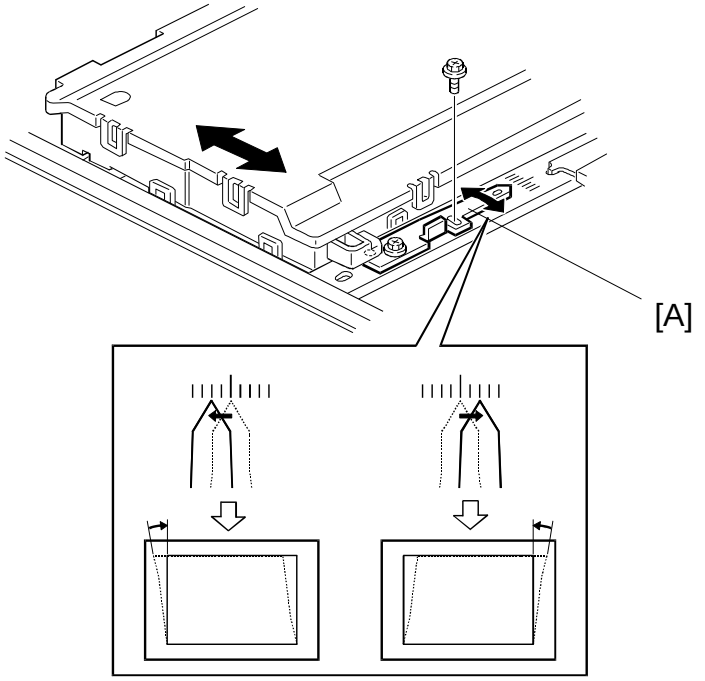
5.3 LD UNIT



A193R503.wmf

1. Remove the copy tray.
2. Remove the main scan synchronizing detector.
3. Remove the laser unit (4 screws, 2 connectors).
4. Remove the LD unit [A] (2 screws).

5.4 LASER UNIT POSITIONING ADJUSTMENT



⚠ CAUTION

Do not open the laser unit cover during the adjustment.

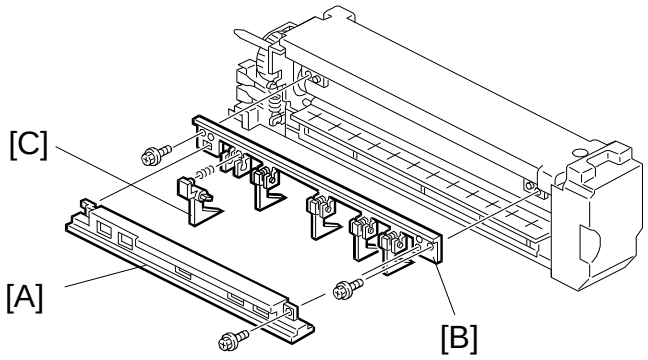
1. Print the trimming pattern on A3 paper and estimate the amount of skew on the printed parallelogram.
2. Loosen the screws securing the laser unit (4 screws).
3. Loosen the screws securing the adjustment lever [A] (2 screws).
4. Move the adjustment lever to the proper position on the scale.

   NOTE: When the adjustment lever is shifted by one unit on the scale, the image skews by 0.2 mm.
5. Secure the adjustment lever (2 screws).
6. Secure the laser unit (4 screws).
7. Check the copy image.

6. FUSING/EXIT

⚠ CAUTION
The fusing unit gets hot. Do not touch the metal part with bare hands.

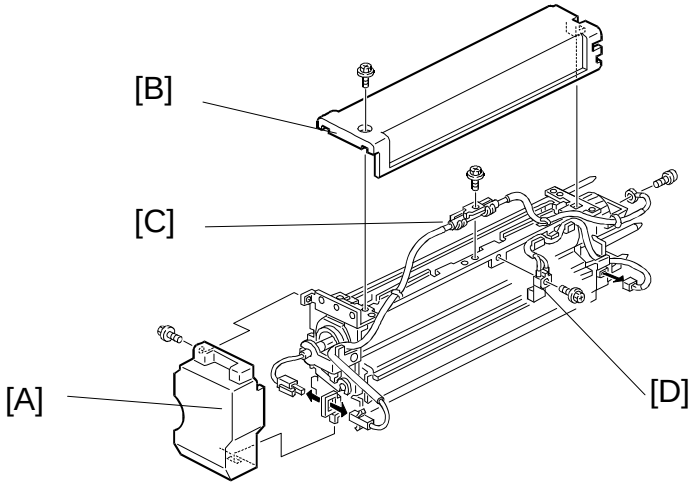
6.1 HOT ROLLER STRIPPERS



A193R023.wmf

1. Pull out the fusing unit (1 screw).
2. Remove the exit guide plate [A] (1 screw).
3. Remove the hot roller stripper bracket [B] (2 screws).
4. Replace the hot roller strippers [C] .

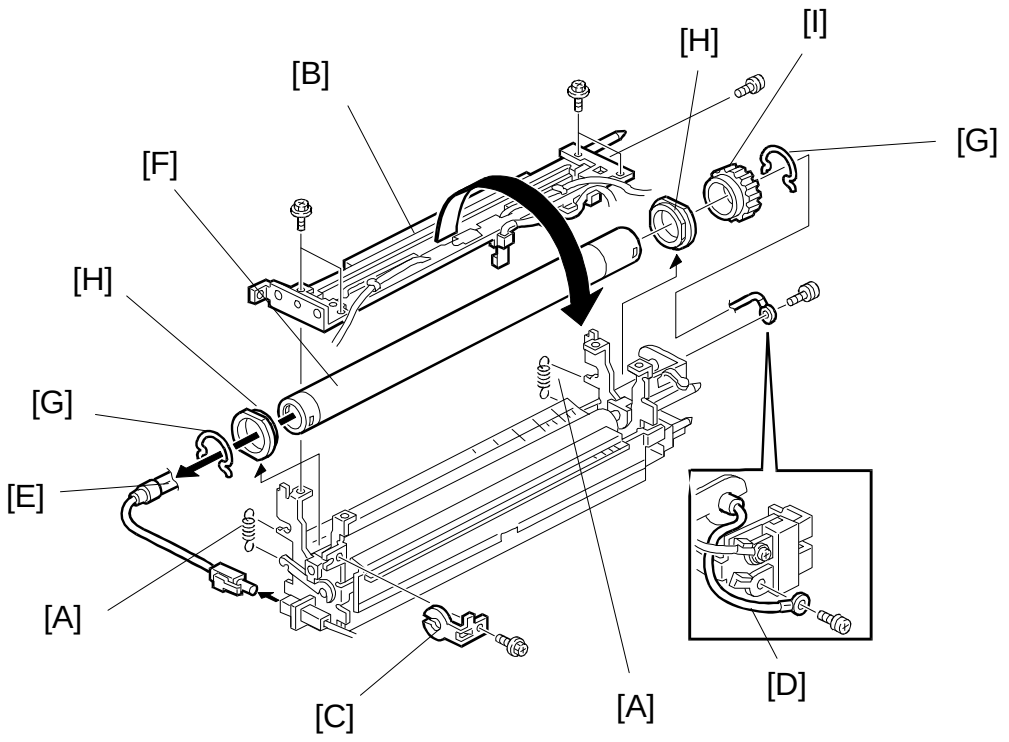
6.2 FUSING THERMISTOR/THERMOFUSE



A193R024.wmf

1. Pull out the fusing unit (1 screw).
2. Remove the front cover [A] (1 screw) and the upper cover [B] (1 screw).
3. Remove the fusing thermofuse [C] (2 screws, 1 connector).
4. Remove the fusing thermistor [D] (1 screw, 1 connector).

6.3 HOT ROLLER/FUSING LAMP



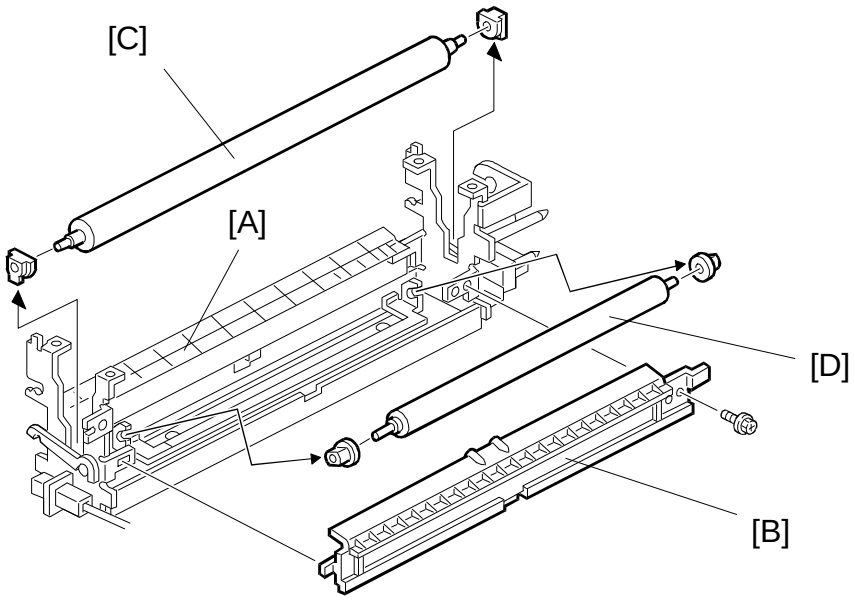
A193R025.wmf

1. Pull out the fusing unit (1 screw).
2. Remove the front cover and upper cover. (See Fusing Thermister/Thermofuse.)
3. Remove the front and rear pressure springs [A] after checking their positions. (The standard positon is in the middle.)
4. Remove the fusing stay [B] (5 screws).
5. Remove the front lamp holder [C] (1 screw).
6. Remove the fusing harness [D] (1 screw and 1 connector), pull the fusing lamp [E] out forward, and keep it in a safe place.
7. Remove the hot roller [F].

   NOTE: Do not touch the hot roller with bare hands.
8. Remove the front and rear C-rings [G], then remove the hot roller bushings [H] and fusing gear [I].

   NOTE: Do not touch the fusing lamp with bare hands.

6.4 PRESSURE ROLLER/CLEANING ROLLER

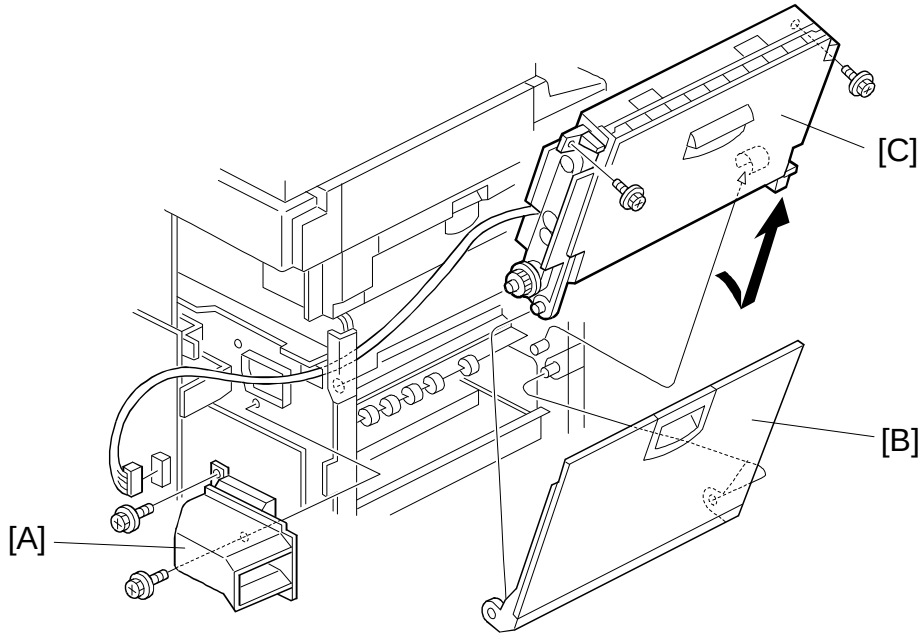


A193R026.wmf

1. Remove the hot roller. (See Hot Roller/Fusing Lamp.)
2. Remove the exit guide plate [A] (1 screw).
3. Check the height position of the entrance guide plate [B] (the upper position is standard) and remove it (1 screw).
4. Remove the pressure roller [C].
5. Remove the cleaning roller [D].

7. EXIT

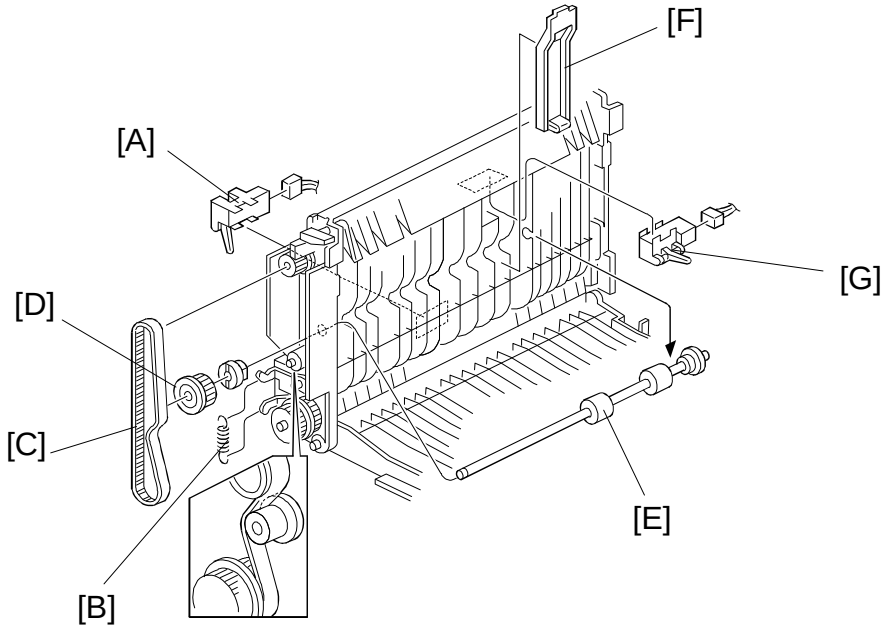
7.1 EXIT UNIT



A193R528.wmf

1. Remove the left cover, front left cover, and rear cover. (See Rear Cover Removal and Left/Right Cover.)
2. Remove the duct [A] (2 screws).
3. Remove the face up tray [B] and the exit unit [C] (2 screws and 1 connector)

7.2 UPPER EXIT SENSOR/LOWER EXIT SENSOR

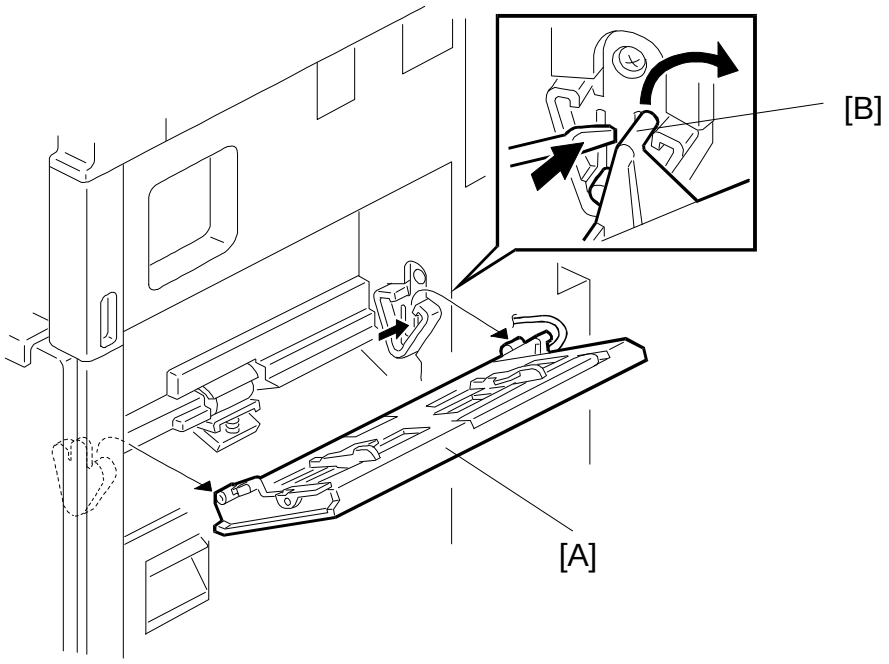


A193R529.wmf

1. Remove the exit unit. (See Exit Unit.)
2. Replace the lower exit sensor [A] (1 connector).
3. Remove the spring [B].
4. Remove the timing belt [C].
5. Remove the pulley [D].
6. Remove the transport roller [E] (2 busing).
7. Remove the harness cover [F].
8. Replace the upper exit sensor [G] (1 connector).

8. PAPER FEED/ REGISTRATION

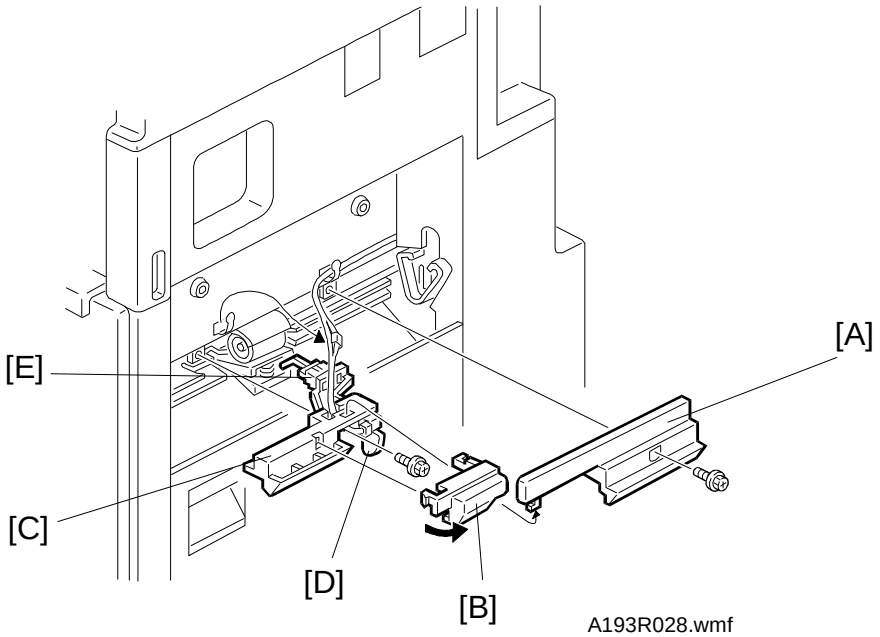
8.1 BY-PASS FEED TRAY



A193R027.wmf

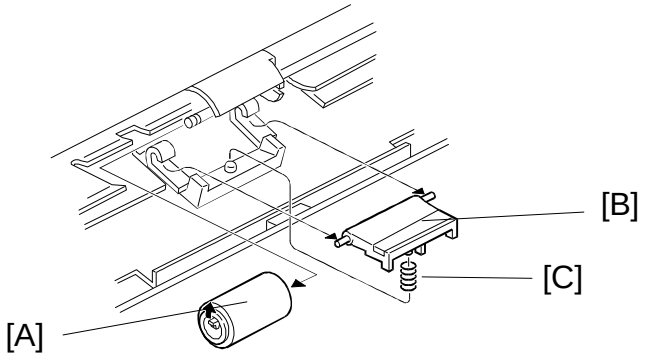
1. Remove the by-pass feed tray [A], holding the hook [B] on the by-pass feed tray with a tool, such as a screwdriver.
2. Disconnect the harness from the IOCSS board.

8.2 BY-PASS FEED PAPER END SENSOR/REGISTRATION SENSOR



1. Remove the by-pass feed tray. (See By-pass Feed Tray.)
2. Remove the paper feed roller cover [A] (1 screw).
3. Remove the cap [B].
4. Remove the sensor holder [C] (1 sensor).
5. Remove the by-pass feed paper end sensor [D] (1 screw).
6. Remove the registration sensor [E] .

8.3 PAPER FEED ROLLER/FRICTION PAD

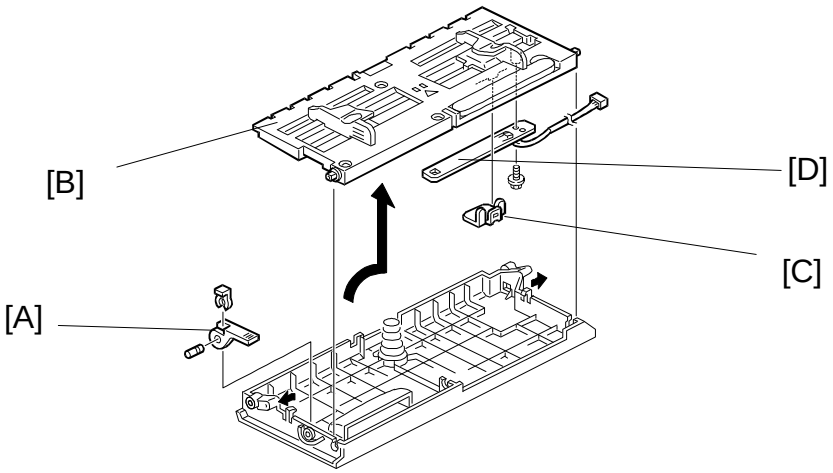


A193R029.wmf

1. Remove the registration sensor and paper end sensor unit. (See By-pass Feed Paper End Sensor/Registration Sensor.)
2. Remove the paper feed roller [A] (1 hook).
3. Remove the friction pad [B].

   NOTE: Do not lose the spring [C].

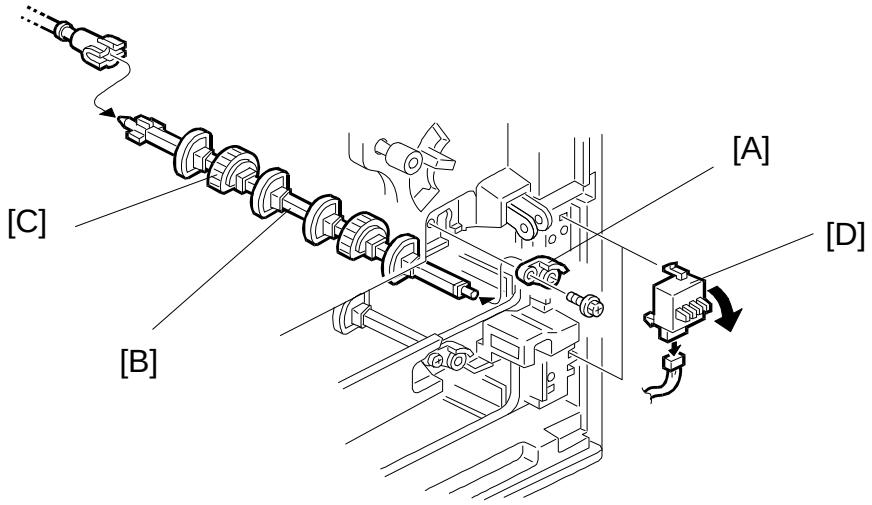
8.4 BY-PASS FEED PAPER WIDTH SENSOR



A193R030.wmf

1. Remove the by-pass feed table assembly (see By-pass Feed Tray).
2. Remove the table lever [A] (1 snap ring and 1 pin).
3. Remove the by-pass feed table [B] (2 hooks).
4. Remove the width sensor spring plate [C].
5. Remove the by-pass feed paper width sensor [D] (1 screw).

8.5 PAPER FEED ROLLERS/PAPER SIZE DETECTOR



A193R031.wmf

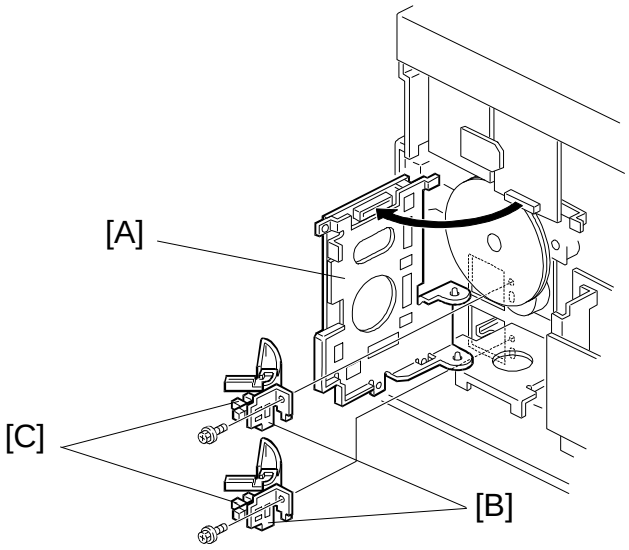
8.5.1 Paper Feed Rollers

1. Remove the paper tray.
2. Remove the front door only when replacing the 1st paper feed roller.
3. Remove the paper feed bushing [A] (1 screw).
4. Pull the paper feed roller shaft [B] out.
5. Replace the paper feed roller [C].

8.5.2 Paper Size Detector

1. Remove the paper tray.
2. Remove the paper size detector [D] (1 connector), while holding it down.

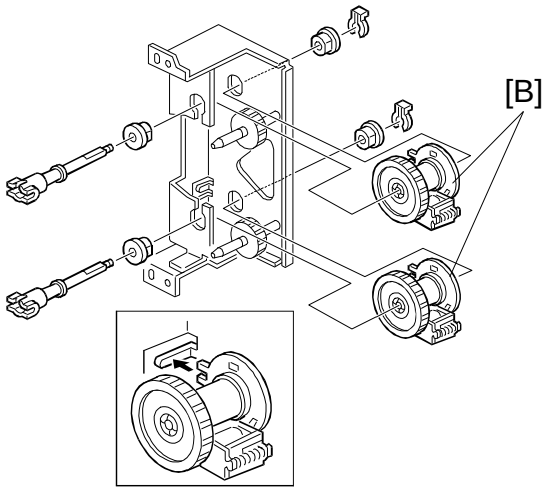
8.6 PAPER END SENSORS



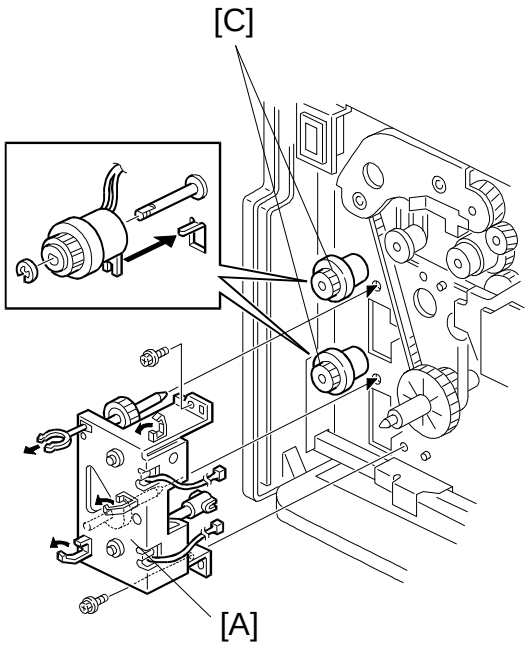
A193R032.wmf

1. Remove the rear cover. (See Rear Cover.)
2. Disconnect the connectors from the right half of the IOCSS board [A] and swing out the IOCSS board (4 screws).
3. Remove the paper end sensor assemblies [B] (1 screw and 1 connector each).
4. Remove the paper end sensors [C].

8.7 PAPER FEED CLUTCHES/RELAY CLUTCHES



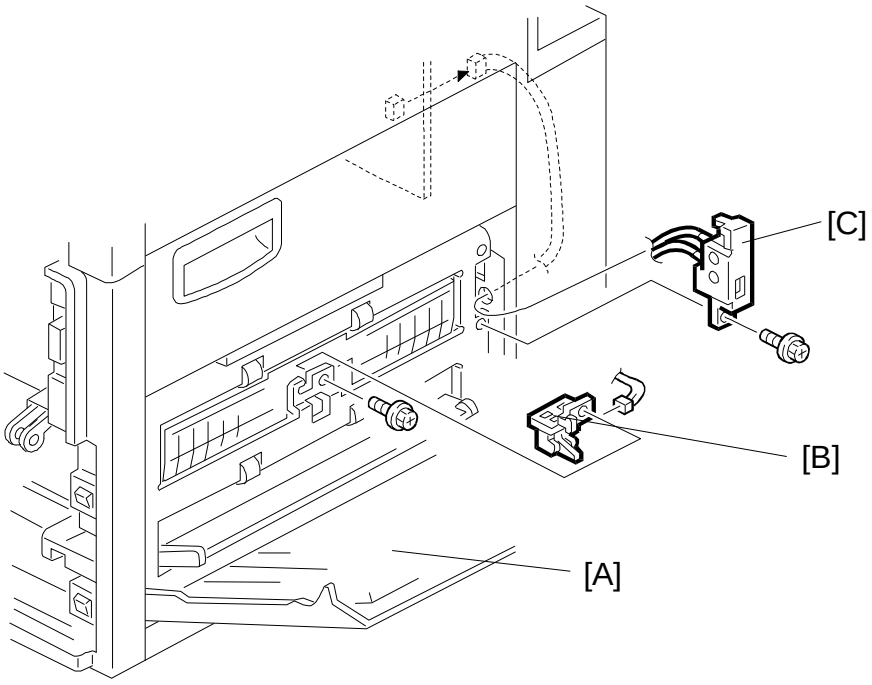
A193R521.wmf



A193R527.wmf

1. Remove the paper feed roller shafts. (See Paper Feed Rollers.)
2. Remove the rear cover. (See Rear Cover.)
3. Remove the paper feed drive bracket [A] (2 screws).
4. Remove the paper feed clutches [B] (1 clip and 1 connector) and relay clutches [C] (1 E-ring and 1 connector).

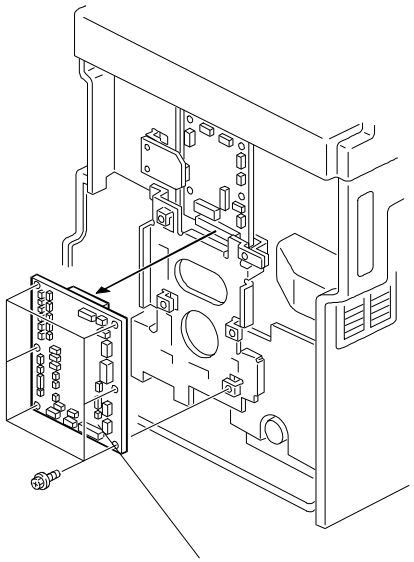
8.8 RELAY SENSOR/RIGHT VERTICAL GUIDE SWITCH



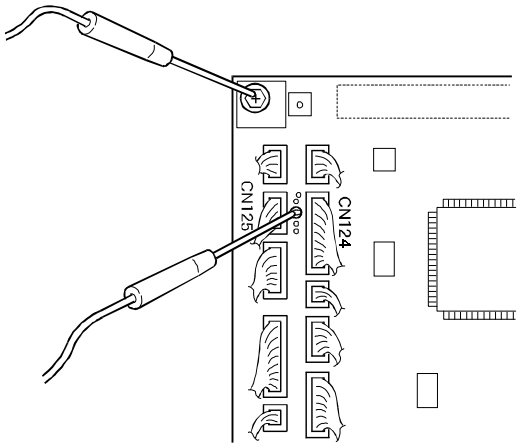
A193R034.wmf

1. Open the right cover [A].
2. Remove the relay sensor [B] (1 connector).
3. Remove the rear cover (See Rear Cover).
4. Remove the right vertical guide switch [C] (1 screw, 1 connector).

9. OTHERS



[A] A193R037.wmf

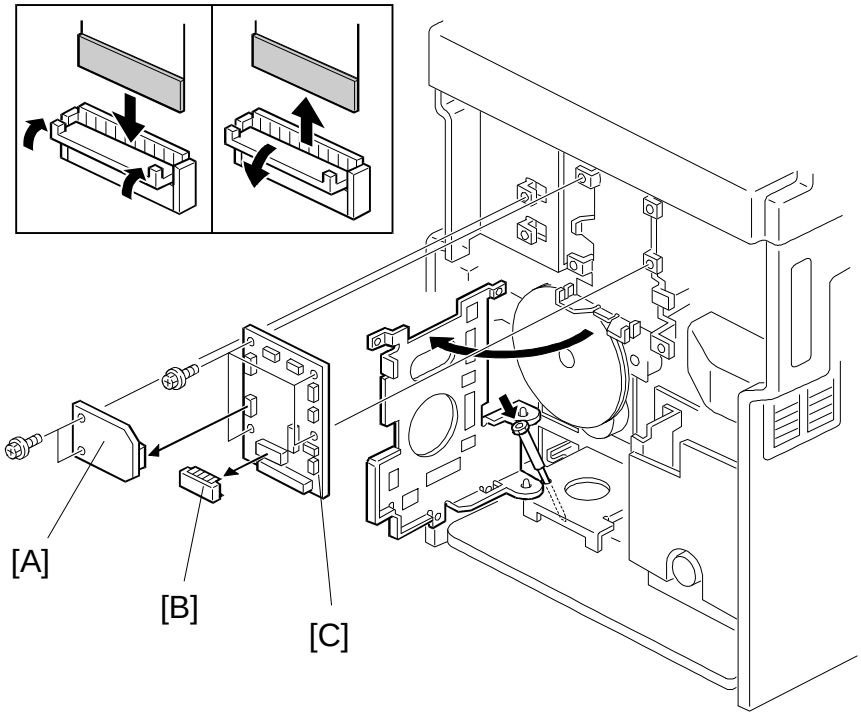


A193R042.wmf

9.1 IOCSS BOARD

1. Remove the rear cover. (See Rear Cover.)
2. Disconnect all connectors from the IOCSS board [A] (33 connectors).
3. Replace the IOCSS board (6 screws).
4. Measure the voltage of the IOCSS board between TP105 and the IOCSS bracket with a multimeter. This is V_{CONT}.
5. Check that the multimeter shows 5.63 ± 0.2 V.
6. If V_{CONT} is not 5.63 ± 0.2 V, access SP2-999 and select 1. Then change the setting of SP 2-996-1 until V_{CONT} is within the specified range.

9.2 MSU BOARD/BICU BOARD

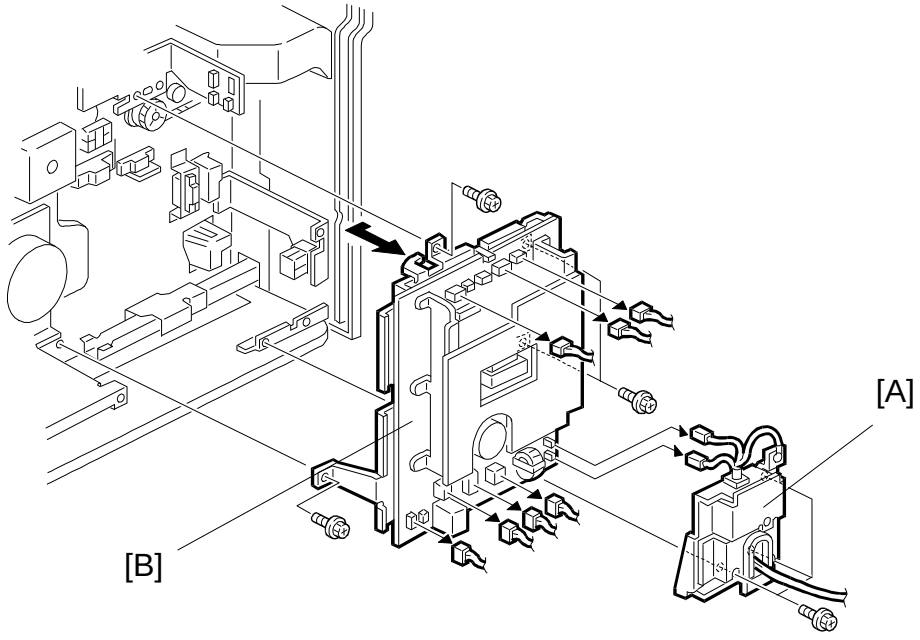


A193R522.wmf

1. Remove the MSU board [A] (2 screws).
2. Disconnect the connectors from the right half of the IOCSS board, remove the 4 screws that secure the bracket, and swing out the IOCSS board.
3. Disconnect all connectors from the BICU board [B] (7 connectors).

   NOTE: When installing the flat cable, push the connector holding the both ends until it clicks into place.
4. Remove the BICU board (4 screws).
5. Remove the NVRAM [C] from the old BICU board and put it on the new BICU board.
6. Install the new BICU board and MSU.

9.3 PSU BOARD



A193R038.wmf

1. Remove the rear cover. (See Rear Cover).
2. Disconnect the connectors from the right half of the IOCSS board, remove the 4 screws that secure the bracket, and swing out the IOCSS board. (See MSU Board/BICU Board.)
3. Remove the power supply cord bracket [A] (3 screws and 2 connectors).
4. Disconnect all connectors of the PSU board.
5. Remove the PSU board bracket assembly [B] (4 screws).

10. STANDARD WHITE DENSITY ADJUSTMENT

This is to adjust the standard white density level.
Perform this adjustment in any of the following conditions:

- After replacing the standard white plate.
- After replacing the NVRAM on the BICU. (If only the BICU is replaced, this adjustment is not necessary, as long as the NVRAM from the old BICU is put on the new BICU.)
- After performing a memory all clear (SP5-801).

Procedure:

1. Place 10 sheets of new A4 sideways or A3 paper on the exposure glass and close the platen cover or the ADF.
2. Enter SP 4-908 and select "1:YES". The standard white density is automatically adjusted.

11. COPY ADJUSTMENT PRINTING/SCANNING

NOTE: 1) You need to perform these adjustment(s) after replacing any of the following parts:

- Scanner Wire
- Lens Block/SBU Assembly
- Scanner Drive Motor
- Polygon Mirror Motor
- Paper Trays
- Duplex Tray
- Paper Side Fence
- Memory All Clear

2) For more details about accessing SP modes, refer to section 4.

11.1 PRINTING

NOTE: 1) Make sure the paper is installed correctly in each paper tray before you start these adjustments.

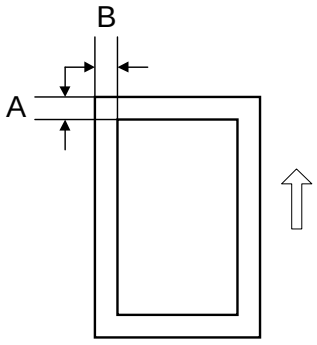
2) Use the Trimming Area Pattern (SP5-902, No.10) to print the test pattern for the following procedures.

3) Set SP 5-902 to 0 again after completing these printing adjustments.

11.1.1 Registration - Leading Edge/Side-to-Side

1. Check the leading edge registration, and adjust it using SP1-001. The specification is: 3 ± 2mm
2. Check the side-to-side registration for each paper feed station, and adjust them using the following SP modes.

	SP mode	Specification
1st paper feed	SP1-002-1	2 ± 1.5 mm
2nd paper feed	SP1-002-2	2 ± 1.5 mm
3rd paper feed (Optional PFU tray 1)	SP1-002-3	2 ± 1.5 mm
4th paper feed (Optional PFU tray 2)	SP1-002-4	2 ± 1.5 mm
By-pass feed	SP1-002-5	2 ± 1.5 mm
Duplex	SP1-002-6	2 ± 1.5 mm



A193R512.wmf

A: Leading Edge Registration
B: Side-to-side Registration

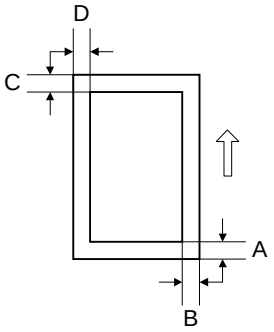
11.1.2 Blank Margin

NOTE: If the leading edge/side-to-side registration can not be adjusted within the specifications, adjust the leading/left side edge blank margin.

1. Check the trailing edge and right side edge blank margins, and adjust them using the following SP modes.

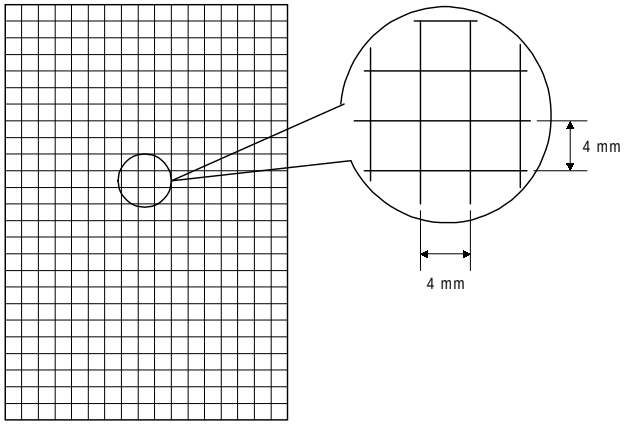
	SP mode	Specification
Trailing edge	SP2-101-2	2±2 mm
Right side edge	SP2-101-4	2±1.5 mm
Leading edge	SP2-101-1	3±2 mm
Left side edge	SP2-101-3	2±1.5 mm

A: Trailing Edge Blank Margin
B: Right Side Edge Blank Margin
C: Leading Edge Blank Margin
D: Left Side Edge Blank Margin



A193R513.wmf

11.1.3 Main Scan Magnification

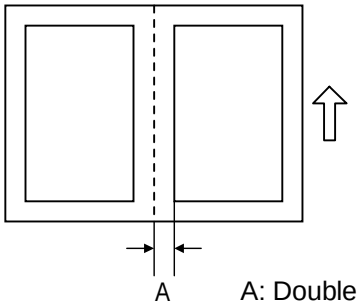


A193R524.wmf

1. Prints the Grid Pattern (SP5-902, No.5).
2. Check the magnification (the grid size should be 4 mm), and adjust the magnification using SP2-998 if necessary. The specification is ± 1%.

11.1.4 Double Copy Registration

NOTE: 1) Perform this adjustment after completing the registration adjustment and the blank margin adjustment for single copies.
2) Select the double copies mode by the Double Copies key using the copy mode to print the test pattern.



A: Double Copy Registration

A193R514.wmf

1. If you need to adjust the double copy registration, use SP1-006.

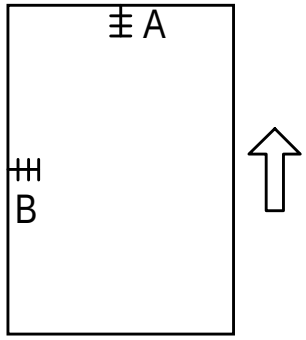
11.2 SCANNING

NOTE: 1) Perform or check the printing registration/side-to-side adjustment and the blank margin adjustment, before doing the following scanner adjustment.
2) Use an OS-A3 test chart to perform the following adjustments.

11.2.1 Registration: Platen Mode

1. Place the test chart on the exposure glass and make a copy from one of the feed stations.
2. Check the leading edge and side-to-side registration, and adjust them using the following SP modes if necessary.

	SP mode
Leading edge	SP4-010
Side-to-side	SP4-011



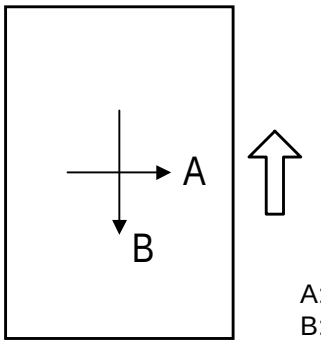
A: Leading Edge Registration
B: Side-to-side Registration

A193R515.wmf

Replacement Adjustment

11.2.2 Magnification

NOTE: Use an OS-A3 test chart to perform the following adjustment.



A: Main Scan Magnification
B: Sub Scan Magnification

A193R517.wmf

1) Main Scan Magnification

1. Place the test chart on the exposure glass and make a copy from one of the feed stations.
2. Check the magnification ratio, and adjust it using the following SP mode if necessary. The specification is ± 1%.

SP mode	
Main Scan Magnification	SP4-008

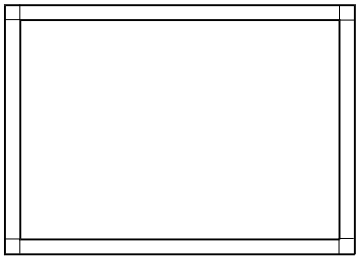
2) Sub Scan Magnification

1. Place the test chart on the exposure glass and make a copy from one of the feed stations.
2. Check the magnification ratio, and adjust it using the following SP mode if necessary. The specification is ± 1%.

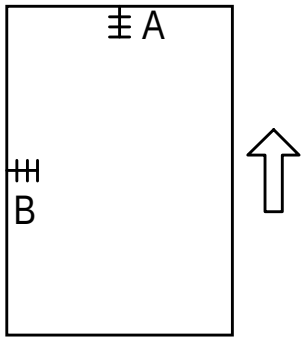
SP mode	
Sub Scan Magnification	SP4-101

11.3 ADF IMAGE ADJUSTMENT

11.3.1 Registration and Blank Margin



A193R516.wmf



A: Leading Edge Registration
B: Side-to-side Registration

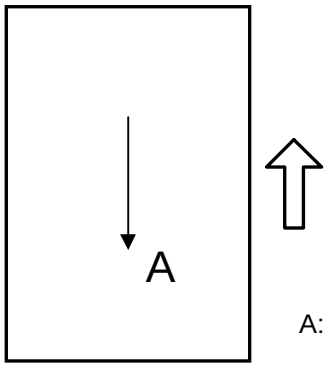
A193R515-2.wmf

NOTE: Make a temporary test chart as shown above using A3/DLT paper.

1. Place the temporary test chart on the ADF and make a copy from one of the feed stations.
2. Check the registration, and adjust using the following SP modes if necessary.

	SP mode
Side-to-side Registration	SP6-006-1
Leading Edge Registration (Simplex)	SP6-006-2
Trailing Edge Blank Margin	SP6-006-3

11.3.2 Sub Scan Magnification



A: Sub scan magnification

A193R526.wmf

NOTE: Make a temporary test chart as shown above using A3/DLT paper.

1. Place the temporary test chart on the ADF and make a copy from one of the feed stations.
2. Check the registration, and adjust using SP 6-007 if necessary. The specification is ± 1%.

12. IMAGE DENSITY ADJUSTMENT BY KEY OPERATOR

Usually, the image density is adjusted with SP2-911 (this changes the coefficient for the TD sensor output). However, if the user wishes to change the image density, the service representative can instruct the user to do this using the following procedure.

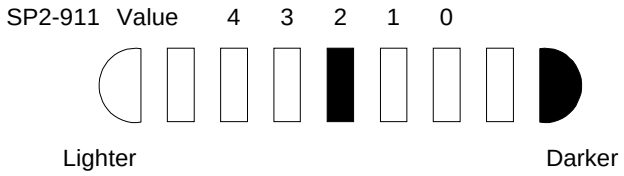


Illustration 1

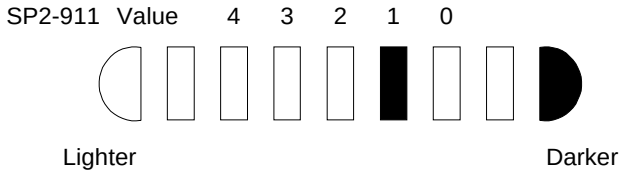


Illustration 2

A193R518.wmf

1. Press the User Tool key.
2. Select the System menu.
3. Press the Darker (or Lighter) key and the # key at the same time.

   NOTE: At this time, the current setting level is displayed on the image density LED. See illustration 1.
4. When holding down both the Darker (or Lighter) key and the # key for over 3 s, the image density LED will be changed to a darker level (or lighter level). See illustration 2.

   NOTE: 1) If the image density level is changes to a darker setting, the machine automatically supplies toner.
   2) Do not select the "0" level.

SECTION 7

TROUBLESHOOTING

1. SERVICE CALL CONDITIONS

1.1 SUMMARY

There are 4 levels of service call conditions.

Level	Definition
A	To prevent the machine from being damaged, the SC can only be reset by a service representative (see the note below). The copier cannot be operated at all.
B	The SC can be reset by turning the main switch off and on if the SC was caused by a sensor error.
C	The copier can be operated as usual except for the unit related to the service call.

NOTE: 1) If the problem concerns electrical circuit boards, first disconnect then reconnect the connectors before replacing the PCBs.

2) If the problem concerns a motor lock, first check the mechanical load before replacing motors or sensors.

3) To reset a Level A SC, enter SP 5-810 (SC code reset) and select "1". Then hold down the Photo mode key and the # key at the same time for at least 3 seconds (this does not require the main switch to be turned off and on).

4) When a Level A or B SC occurs while in an SP mode, the display does not indicate the SC number. If this occurs, check the SC number after leaving the SP mode.

2. SC CODE DESCRIPTIONS

SC120: Scanner home position error 1

-Definition- [B]

The scanner home position sensor does not detect the off condition during initialization or copying.

- Possible causes -

- Scanner home position sensor defective
- Scanner drive motor defective
- IOSCC board defective
- Scanner home position sensor harness defective

SC121: Scanner home position error 2

-Definition- [B]

The scanner home position sensor does not detect the on condition during initialization or copying.

- Possible causes -

- Scanner home position sensor defective
- Scanner drive motor defective
- IOCSS board defective
- Scanner home position sensor harness defective

SC122: Scanner home position error 3

-Definition- [B]

The scanner home position sensor detects the on condition while the scanner is returning to the home position.

- Possible causes -

- Scanner home position sensor defective
- Scanner drive motor defective
- IOCSS board defective
- Scanner home position sensor harness defective

SC123: Scanner home position error 4

-Definition- [B]

The scanner home position sensor does not detect the on condition after the scanner returns to the home position.

- Possible causes -

- Scanner home position sensor defective
- Scanner drive motor defective
- IOCSS board defective
- Scanner home position senor harness defective

SC192: Automatic SBU adjustment error

-Definition- [B]

An error is detected during automatic SBU adjustment.

- Possible cause -

- SBU defective
- BiCU board defective
- Lamp regulator defective
- Exposure lamp deective
- Dirty white plate

SC302: Charge roller current leak

-Definition- [B]

A charge roller current leak signal is detected.

- Possible causes -

- Charge roller damaged
- Charge high voltage supply board defective
- Poor connection of the PCU

SC306: Charge roller home position error

-Definition- [B]

The charge roller contact sensor does not detect the on condition.

- Possible causes -

- Charge roller contact sensor defective
- Charge roller contact clutch defective

SC320: Polygon motor error

-Definition- [B]

The polygon motor does not reach its operating speed within 10 seconds after the polygon motor on signal, or the lock signal is not detected for more than 40 ms continuously during operation.

- Possible causes -

- Polygon motor defective
- Poor connection of the interface harness which connects the polygon motor driver and the IOCSS board
- IOCSS board defective

SC321: No laser start signal (F-GATE error)

NOTE: This SC code is only for copy mode.

- Definition- [B]

The CPU does not detect the laser start signal (F-GATE) after the copy paper reaches the registration sensor.

- Possible causes -

- BiCU board defective
- MSU board defective

SC322: Laser synchronization error

-Definition- [B]

The laser synchronization signal cannot be detected by the main scan synchroniziation detector board for more than 5 consecutive 100 intervals.

- Possible causes -

- Poor connection of the interface harness which connects the laser synchronization detector board and the BiCU board
- Laser synchronization detector board out of position
- Laser synchronization detector board defective
- BiCU board defective

SC324: LD drive current over

-Definition- [B]

The LD drive board applies more than 100 mA to the LD.

- Possible causes -

- LD unit defective (not enough power, due to aging)
- Poor connection of the interface harness which connects the LD unit and the BiCU board
- Temperature around the LD unit is too high

SC390: TD sensor error 1

-Definition- [B]

The TD sensor outputs less than 0.5V, 20 s after the TD sensor initial setting has been performed.

- Possible causes -

- TD sensor abnormal
- Poor connection of the PCU

SC391: Development bias leak

-Definition- [B]

A development bias leak signal is detected.

- Possible causes -

- Poor connection of the PCU
- High voltage supply board defective

SC393: TD sensor error 2

-Definition- [B]

TD sensor output voltage falls out of the adjustment range (2.0 ± 0.2 V) after the TD sensor initial setting has been finished.

- Possible causes -

- TD sensor abnormal
- Poor connection of the PCU

SC401: Transfer roller leak error 1
SC402: Transfer roller leak error 2

-Definition- [B]

A transfer roller current leak signal is detected.

- Possible causes -

- High voltage supply board defective
- Poor connection of the PCU
- Transfer roller damaged

SC411: Separation bias error

-Definition- [B]

A separation bias leak signal is detected.

- Possible causes -

- High voltage supply board defective
- Poor connection of the PCU
- Discharge brush defective

SC500: Main motor lock

-Definition- [B]

A main motor lock signal is detected for more than 5 seconds or the lock signal is not detected for more than 500 ms during rotation.

- Possible causes -

- Too much load on the drive mechanism
- Main motor defective

SC503: Upper tray lift motor malfunction (optional paper tray unit only)
SC504: Lower tray lift motor malfunction (optional paper tray unit only)

-Definition- [C]

The paper upper limit sensor is not activated after the tray lift motor has been on for 10 seconds.

- Possible causes -

- Upper limit sensor defective
- Tray lift motor defective
- IOCSS board defective

SC506: Paper tray unit main motor lock (optional paper tray unit only)

-Definition- [C]

A main motor lock signal is detected for more than 5 seconds or the lock signal is not detected for more than 5 seconds during rotation.

- Possible causes -

- Paper tray unit main motor defective
- Too much load on the drive mechanism

SC542: Fusing temperature warm-up error

-Definition- [A]

The fusing temperature does not reach the fusing standby temperature within 50 seconds after the main switch is turned on.

- Possible causes -

- Fusing thermistor defective or out of position
- Fusing lamp open
- Fusing thermofuse open
- Power supply board defective
- Poor connection of the fusing unit

SC543: Fusing overheat error

-Definition- [A]

A fusing temperature of over 231°C is detected for 1 second by the fusing thermistor.

- Possible causes -

- Fusing thermistor defective
- Power supply board defective

SC544: Fusing low temperature error

-Definition- [A]

A fusing temperature of lower 100°C is detected for 1 second by the fusing thermistor.

- Possible causes -

- Fusing thermistor defective
- Power supply board defective

SC546: Fusing ready temperature malfunction

-Definition- [A]

The fusing temperature goes 10 °C below or 10 °C over the stand-by temperature after warm-up is completed.

- Possible causes -

- Thermistor defective
- Poor connection of the fusing unit
- Power supply board defective

SC547: Zero cross signal malfunction

-Definition- [A]

Zero cross signals are not detected within a certain period.

- Possible causes -

- Power supply board defective
- IOCSS defective
- BICU defective

SC610: Communication error between IOCSS and duplex unit

-Definition- [B]

The IOCSS board cannot communicate with the duplex unit properly.

- Possible causes -

- Poor connection of the duplex unit
- IOCSS board defective
- Duplex control board defective

SC691: Communication error between BICU and fax controller

-Definition- [B]

The BiCU board cannot communicate with the fax controller properly.

- Possible causes -

- Poor connection of the interface harness which connects the BiCU board and the fax controller
- BICU board defective
- Fax controller defective

SC692: Communication error between BiCU and printer controller

-Definition- [B]
The BICU board cannot communicate with the printer controller properly.

- Possible causes -
- Poor connection of the interface harness which connects the BICU board and the mother board.
- Poor connection between the mother board and the printer controller
- BICU board defective
- Printer controller defective
- Mother board defective

SC900: Total counter error

-Definition- [C]
The total counter is not working properly.

- Possible causes -
- Total counter defective
- IOCSS board defective

SC920: MSU connection error

-Definition- [B]
The MSU set signal is not detected

- Possible cause -
- Poor connection between the BICU board and the MSU
- BICU board defective
- MSU defective

SC921: MSU hardware error

-Definition- [B]
The hardware of the MSU is defective

- Possible cause -
- MSU defective
- BICU defective
- Front door safety switch does not work properly

SC980: Program loading error

-Definition- [C]
The program cannot load properly.

- Possible cause -
- Poor connection between the BICU and the ROM board
- BICU board defective
- ROM board or the program defective

SC981: NVRAM clear error

-Definition- [C]
The data stored in the NVRAM is not cleared properly when the Memory All Clear is performed.

- Possible cause -
- NVRAM defective

SC990: Communication error between BICU and IOCSS board

-Definition- [B]
The BiCU board cannot communicate with the IOCSS board properly.

- Possible cause -
- Poor connection between the BiCU board and the IOCSS board
- BiCU board defective
- IOCSS board defective

3. ELECTRICAL COMPONENT DEFECTS

3.1 SENSORS

Component (Symbol)	CN	Condition	Symptom
Upper Exit (S1)	157-11 (IOCSS)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Lower Exit (S2)	157-8 (IOCSS)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Left Vertical Door (S3)	157-5 (IOCSS)	Open	The Door Open indicator does not light even if the left vertical door is opened.
		Shorted	The Door Open indicator lights even if the left vertical door is closed.
Left Door (S4)	157-2 (IOCSS)	Open	The Door Open indicator does not light even if the left door is opened.
		Shorted	The Door Open indicator lights even if the left door is closed.
Relay (S5)	104-2 (IOCSS)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
PCU Detect (S6)	151-1 (IOCSS)	Open	The TD sensor initial setting procedure is not performed when a new PCU is installed.
		Shorted	The TD sensor initial setting procedure is performed whenever the front cover is closed.
Fusing Exit (S7)	151-6 (IOCSS)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Charge Roller Contact (S8)	151-9 (IOCSS)	Open	No Symptom
		Shorted	SC306 is displayed.
Upper Tray Paper End (S9)	103-2 (IOCSS)	Open	The Paper End indicator lights even if paper is placed in the upper paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the upper paper tray.
Lower Tray Paper End (S10)	103-5 (IOCSS)	Open	The Paper End indicator lights even if paper is placed in the lower paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the lower paper tray.
By-pass Feed Paper End (S11)	119-4 (IOCSS)	Open	The Paper End indicator lights even if paper is placed on the by-pass feed tray.
		Shorted	The Paper End indicator does not light even if there is no paper on the by-pass feed tray.

Component (Symbol)	CN	Condition	Symptom
Registration (S12)	119-6 (IOCSS)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
By-pass Feed Paper Width (S13)	122-1~4 (IOCSS)	Open	The CPU cannot detect the proper paper width.
		Shorted	
Humidity (S14)	109-3 (IOCSS)	Open	A lighter image copy will be made.
		Shorted	A darker image copy will be made.
Original Width (S15)	131-2~3 (IOCSS)	Open	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Original Length-1 (S16)	132-A1~A2 (IOCSS)	Open	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Original Length-2 (S17)	132-A8~A9 (IOCSS)	Open	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Platen Cover (S18)	132-B7 (IOCSS)	Open	APS and ARE do not function correctly.
		Shorted	No symptom
Scanner H.P (S19)	132-B9 (IOCSS)	Open	SC120 is displayed.
		Shorted	The CPU does not detect the scanner home position and the scanner motor does not stop.
Toner Density (S20)	125-3 (IOCSS)	Open	SC393 is displayed. (See the note.)
		Shorted	SC390 is displayed. (See the note.)

NOTE: An SC condition occurs only when a new PCU is being installed in the machine. During copying, if the TD sensor fails, the image density will be changed.

3.2 SWITCHES

Component (Symbol)	CN	Condition	Symptom
AC (SW1)	282-1,2 (PSU)	Open	The machine does not turn on.
		Shorted	The machine does not turn off.
Main (SW2)	309-12 (BICU)	Open	The LCD does not off even if the main switch is turned off.
		Shorted	The LCD does not on even if the main switch is turned on.
Right Vertical Guide (SW3)	112-2 (IOCSS)	Open	The Cover Open indicator is not lit even if the right vertical guide is opened.
		Shorted	The Cover Open indicator is lit even if the right vertical guide is closed.
Upper Paper Size (SW4)	102-1,2,4,5 (IOCSS)	Open	The CPU cannot detect the proper paper size, and misfeeds may occur when a copy is made.
		Shorted	
Lower Paper Size (SW5)	102-6,7,9,10 (IOCSS)	Open	The CPU cannot detect the proper paper size, and misfeeds may occur when a copy is made.
		Shorted	
Front Door Safety (SW6)	120-1,134-3 (IOCSS)	Open	The Cover Open indicator is not lit even if the right vertical guide is opened.
		Shorted	The Cover Open indicator is lit even if the right vertical guide is closed.

4. BLOWN FUSE CONDITIONS

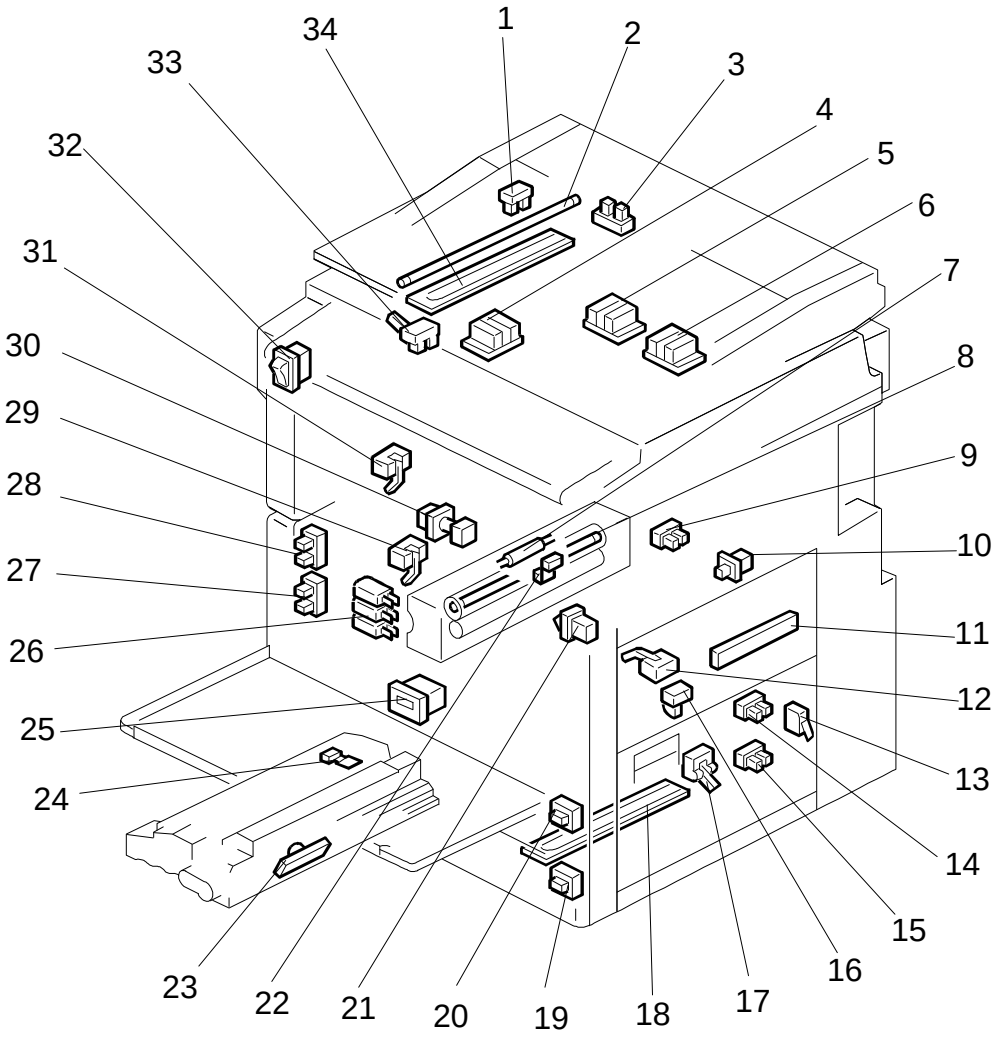
Fuse	Rating		Symptom when turning on the main switch
	115 V	220 ~ 240 V	
Power Supply Board			
FU1	15 A/125 V	----	No response.
FU2	8 A/125 V	5 A/250 V	No response
FU4	6.3 A/125 V	6.3 A/125 V/250V	"Doors/Covers Open" is displayed then SC120 is displayed
FU5	4 A/125 V	4 A/125 V/250 V	SC900 is displayed
FU6	4 A/125 V	4 A/125 V/250 V	Normal operation (This fuse is on the +24V line of CN287 but it is not used.)

SECTION 8

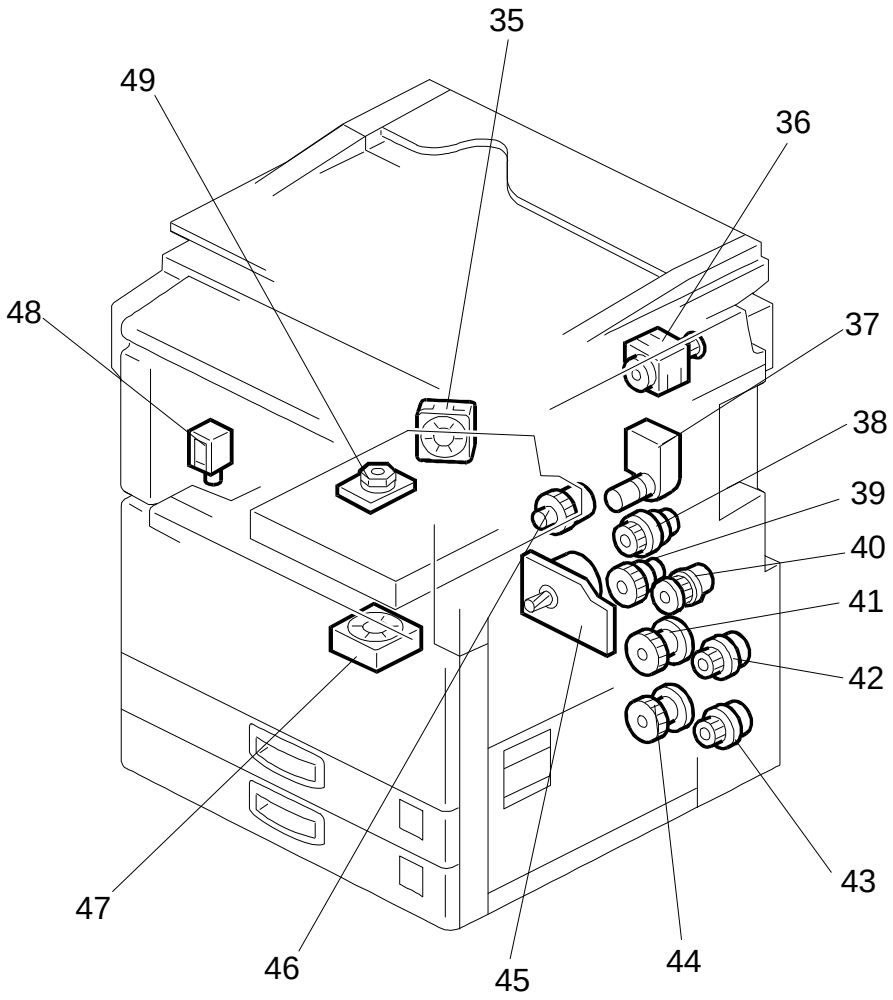
OPTIONS

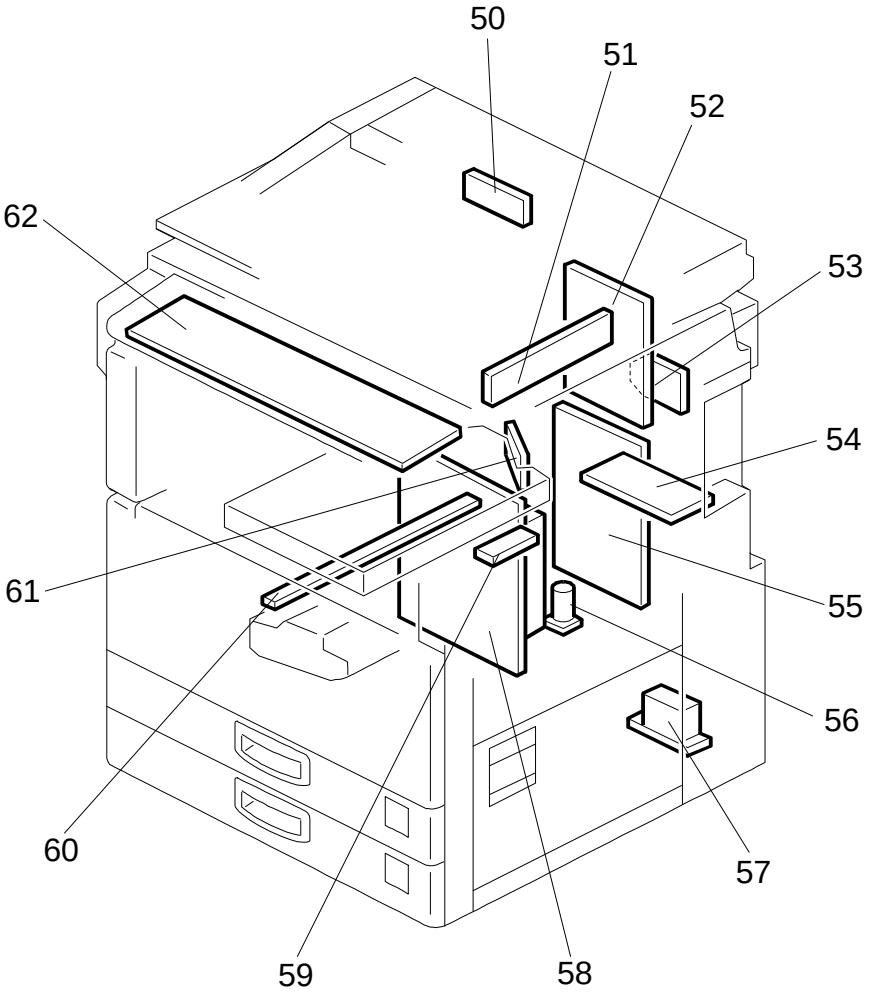
ELECTRICAL COMPONENT LAYOUT

Copier



A193S502.wmf


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A193S501.wmf


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A193S500.wmf

Copier

Symbol	Index No.	Description	P to P (1/2)
Printed Circuit Boards			
PCB1	54	High Voltage Supply Board	K17
PCB2	50	Lamp Stabilizer	M16
PCB3	58	PSU	C7
PCB4	61	LD Unit	E5
PCB5	62	Operation Panel	F1
PCB6	51	SBU	H1
PCB7	55	IOCSS	I14
PCB8	52	BICU	H12
PCB9	53	MSU	I6
Motors			
M1	45	Main	I17
M2	36	Scanner Drive	N17
M3	47	Transport Vacuum Fan	O17
M4	49	Polygonal Mirror	D4
M5	37	Toner Supply	F17
M6	35	Exhaust Fan	D17
Sensors			
S1	33	Upper Exit	B17
S2	31	Lower Exit	B17
S3	28	Left Vertical Door	B17
S4	27	Left Door	C17
S5	17	Relay	C17
S6	10	PCU	C17
S7	29	Fusing Exit	D17
S8	9	Charge Roller H.P	D17
S9	14	Upper Tray Paper End	E17
S10	15	Lower Tray Paper End	E17
S11	16	By-pass Feed Paper End	F17
S12	12	Registration	G17
S13	11	By-pass Feed Paper Width	G17
S14	59	Humidity	C11
S15	4	Original Width	L17
S16	5	Original Length-1	L17
S17	6	Original Length-2	L17
S18	3	Platen Cover	M17
S19	1	Scanner H.P.	M17
S20	23	Toner Density (TD)	H17
Switches			
SW1	21	AC	B6
SW2	32	Main	D2
SW3	13	Right Vertical Guide	H17

Symbol	Index No.	Description	P to P (1/2)
SW4	20	Upper Paper Size	N17
SW5	19	Lower Paper Size	O17
SW6	26	Front Door Safety	D11
Magnetic Clutches			
MC1	46	Charge Roller Contact	E17
MC2	42	Upper Relay	E17
MC3	43	Lower Relay	I17
MC4	40	By-pass Feed	F17
MC5	41	Upper Paper Feed	I17
MC6	44	Lower Paper Feed	I17
MC7	39	Registration	F17
MC8	38	Development	J17
Solenoids			
SOL1	48	Junction Gate	B17
Lamps			
L1	60	Quenching	E17
L2	2	Scanner	M17
L3	8	Fusing	B7
Heaters			
H1	18	Tray (option)	C4
H2	34	Anti-condensation (option)	D4
Thermistors			
TH1	24	Charge Roller	H17
TH2	22	Fusing	B6
Thermofuses			
TF1	7	Fusing	B7
Counters			
CO1	25	Total	I17
CO2	---	Key (option)	G17
Others			
LSD1	30	Laser Synchronization Detector	D4
NF	56	Noise Filter (230V machine only)	C10
CB	57	Circuit Breaker (230V machine only)	B8

A193 Point to Point Diagram (1/2)

Signal Table
- AC Line
- DC Line
- Pulse Signal
- Signal Direction
- Active High
- Active Low
- [ ] Voltage
- [A] Analog Signal

AC SW (SW1)
Thermistor (TH2)
Fusing Lamp (L3)
Thermofuse (TF1)
Circuit Breaker (230V machine only) (CF1)
Tray Heater (Option) H1
Anti-condensation Heater (Option) H2
Noise Filter (230V machine only) (NF 1)
Main Switch (SW2)
Laser Syncronization Detector(LSD)
Polygonal Mirror Motor M4
Front Door Safety SW (SW6)

Duplex Unit (Op)
- Duplex Entrance Sensor S1
- Duplex Junction Gate Sol SOL1
- Duplex Transport Motor M1
- Duplex Feed Motor M2
- Duplex Control Board (PCB1)
- Duplex Turn Sensor S2
- Duplex Exit Sensor S3

PSU(PCB3)

LD Unit (PCB4)

Humidity Sensor S14

Operation Panel (PCB5)

SBU (PCB6)

<CN301> (SBU)

PIN	NAME	PIN	NAME
1	< /OPBSYNC	26	< AD0
2	/RDSYNC >	27	GND
3	GND	28	AGC0 >
4	/CLK 0 >	29	AGC1 >
5	GND	30	GND
6	/WTGT >	31	AGC2 >
7	/PWIND >	32	AGC3 >
8	/AEMODE >	33	GND
9	GND	34	+12
10	DAD 1 >	35	+12
11	GND	36	+12
12	DACLK >	37	+12
13	GND	38	+12
14	DALD >	39	+12
15	GND	40	GND
16	< AD7	41	-12V
17	< AD6	42	-12V
18	GND	43	-12V
19	< AD5	44	GND
20	< AD4	45	+5V
21	GND	46	+5V
22	< AD3	47	+5V
23	< AD2	48	+5V
24	GND	49	+5V
25	< AD1	50	+5V

<CN311> (BICU - ROM Board)

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
1	GND	21	A12 >	41	< D14 >	61	< /SLEEP
2	< D3 >	22	A7 >	42	< D15 >	62	NC
3	< D4 >	23	A6 >	43	/CE2 >	63	NC
4	< D5 >	24	A5 >	44	NC	64	NC
5	< D6 >	25	A4 >	45	NC	65	< D8 >
6	< D7 >	26	A3 >	46	NC	66	< D9 >
7	/CE1 >	27	A2 >	47	A17 >	67	< D10 >
8	A10 >	28	A1 >	48	A18 >	68	NC
9	/OE >	29	A0 >	49	A19 >	69	GND
10	A11 >	30	< D0 >	50	A20 >	70	GND
11	A9 >	31	< D1 >	51	A21 >		
12	A8 >	32	< D2 >	52	+5V		
13	A13 >	33	NC	53	VPP2		
14	A14 >	34	GND	54	A22 >		
15	/WE >	35	GND	55	A23 >		
16	/BSY >	36	GND	56	< /WP		
17	+5V	37	NC	57	< /BYTE		
18	VPP1	38	< D11 >	58	NC		
19	A16 >	39	< D12 >	59	NC		
20	A15 >	40	< D13 >	60	< /EXCARD		

<CN308> (BICU - IOCSS)

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
1	-12V	21	< FUTMP	41	+12V	61	GND
2	-12V	22	< PP-C	42	BDTCT	62	< CHTMP
3	+5VE	23	< PP-B	43	+12V	63	GND
4	+5VS	24	< HUM	44	+5V	64	< PP-TP
5	S1 >	25	< PP-D	45	+5V	65	GND
6	S3 >	26	GND	46	S2 >	66	< TSENS
7	A0 >	27	GND	47	+5V	67	GND
8	A2 >	28	MA1 >	48	A1 >	68	GND
9	A3 >	29	MA2 >	49	+5V	69	GND
10	< D9 >	30	MA4 >	50	< D8 >	70	MA3 >
11	< D10 >	31	MA5 >	51	+5V	71	GND
12	< D12 >	32	MA7 >	52	< D11 >	72	MA6 >
13	< D13 >	33	MA8 >	53	+5V	73	GND
14	< D15 >	34	MA10 >	54	< D14 >	74	MA9 >
15	/RD >	35	MB1 >	55	+5V	75	GND
16	/RST, 10B >	36	MB2 >	56	/HWR >	76	GND
17	< /INT 1	37	MB3 >	57	+5V	77	GND
18	CLKP >	38	MB4 >	58	< /INT2	78	+24V
19	GND	39	/RTRG >	59	GND	79	+24V
20	GND	40	< SN-ON	60	GND	80	BDTCT

BICU (PCB8)

Mother Board

<CN310> (BICU-Mother Board)

PIN	NAME	PIN	NAME
1	GND	11	GND
2	< MDEO	12	TXD 2 >
3	GND	13	< RXD 2
4	/FGATE >	14	GND
5	/OE 2 >	15	TXD 3 >
6	/OE 3 >	16	< RXD 3
7	N.C.	17	GND
8	GND	18	/BD >
9	/RTS >	19	N.C.
10	< /CTS	20	/WRSYNC >

Printer Controller (Op) See 2/2

Fax Unit (Op) See 2/2

MSU(PCB9)

<CN303> (BICU - MSU)

PIN	NAME	PIN	NAME
1	GND	31	GND
2	GND	32	GND
3	/MWCLK >	33	GND
4	/MWLGT >	34	GND
5	/MWLSYC >	35	/MWFGT >
6	MOD >	36	GND
7	GND	37	GND
8	< /MRCLK	38	GND
9	< /MRLGT	39	/WRSYNC >
10	< /MRLSYC	40	< /MRFGT
11	< MID	41	GND
12	GND	42	GND
13	A7(N,C)	43	A6(N,C)
14	A5(N,C)	44	A4 >
15	A3 >	45	A2 >
16	A1 >	46	A0 >
17	GND	47	GND
18	< D15 >	48	< D14 >
19	< D13 >	49	< D12 >
20	< D11 >	50	< D10 >
21	< D9 >	51	< D8 >
22	/RD >	52	/HWR >
23	CS50 >	53	/CS51 >
24	/RESET >	54	< /MDTCT
25	GND	55	GND
26	+5V	56	+5V
27	+5V	57	+5V
28	+5V	58	+5V
29	GND	59	GND
30	GND	60	GND

Paper Tray Unit (Option)
- Upper Paper Size Sensor S7
- Lower Paper Size Sensor S8
- Upper Paper End Sensor S1
- Lower Paper End Sensor S2
- Upper Relay Sensor S5
- Lower Relay Sensor S6
- Tray Cover SW (SW1)
- Upper Paper Feed Cl MC1
- Lower Paper Feed Cl MC2
- Upper Relay Cl MC3
- Lower Relay Cl MC4
- Paper Feed Motor M1
- Upper Paper Lift Motor M2
- Lower Paper Lift Motor M3
- Upper Tray Upper Limit Sensor S3
- Lower Tray Upper Limit Sensor S4
- Tray Heater H1

Paper Tray Unit Drive Board (PCB1)

IOCSS (PCB7)

ADF (Op)
- DF Feed Motor M1
- DF Pick-up Sol SOL1
- Stamper Sol SOL2
- DF Feed Cl MC1
- APS Start Sensor S1
- DF Position Sensor S2
- Feed Cover Open Sensor S4
- Original Length-2 Sensor S9
- Original Length-1 Sensor S8
- Original Width-3 Sensor S7
- Original Width-2 Sensor S6
- Original Width-1 Sensor S5
- Original Set Sensor S10
- Registration Sensor S3

DF Drive Board (PCB1)

1 bin Sorter (Op)
- Sorter Transport Motor M1
- Sorter Paper Indicator (PCB2)
- Sorter Vertical Guide Door SW (SW1)
- Sorter Junction Gate Sol SOL1
- Sorter Pape Sensor S1

1bin Sorter Drive Board (PCB1)

- Junction Gate C1 SOL1
- Upper Exit Sensor S1
- Lower Exit Sensor S2
- Left Vertical Door Sensor S3
- Left Door Sensor S4
- Relay Sensor S5
- PCU Sensor S6
- Exhaust Fan M6
- Fusing Exit Sensor S7
- Charge Roller H.P Sensor S8
- Charge Roller Contact Cl MC1
- Quenching Lamp L1
- Upper Tray Paper End Sensor S9
- Lower Tray Paper End Sensor S10
- Upper Relay Cl MC2
- Registration Cl MC7
- By-pass Feed Cl MC4
- Toner Supply Motor M5
- By-pass Feed Paper End Sensor S11
- Registration Sensor S12
- By-pass Feed Paper Width Sensor S13
- Key Counter (Op) C02
- Right Vertical Guide SW (SW3)
- Charge Roller Thermistor TH1
- TD Sensor S20
- Upper Paper Feed Cl MC5
- Lower Relay Cl MC3
- Lower Paper Feed Cl MC6
- Total Counter CO1
- Development Cl MC8
- Main Motor M1
- High Voltage Supply Board PCB1
- Original Width Sensor S15
- Original Length Sensor 1 S16
- Original Length Sensor 2 S17
- Scanner Lamp L2
- Lamp Stabilizer PCB2
- Platen Cover Sensor S18
- Scanner H.P Sensor S19
- Scanner Drive Motor M2
- Upper Paper Size Sensor SW4
- Lower Paper Size Sensor SW5
- Transport Vacuum Fan M3

A193 Point to Point Diagram (2/2)

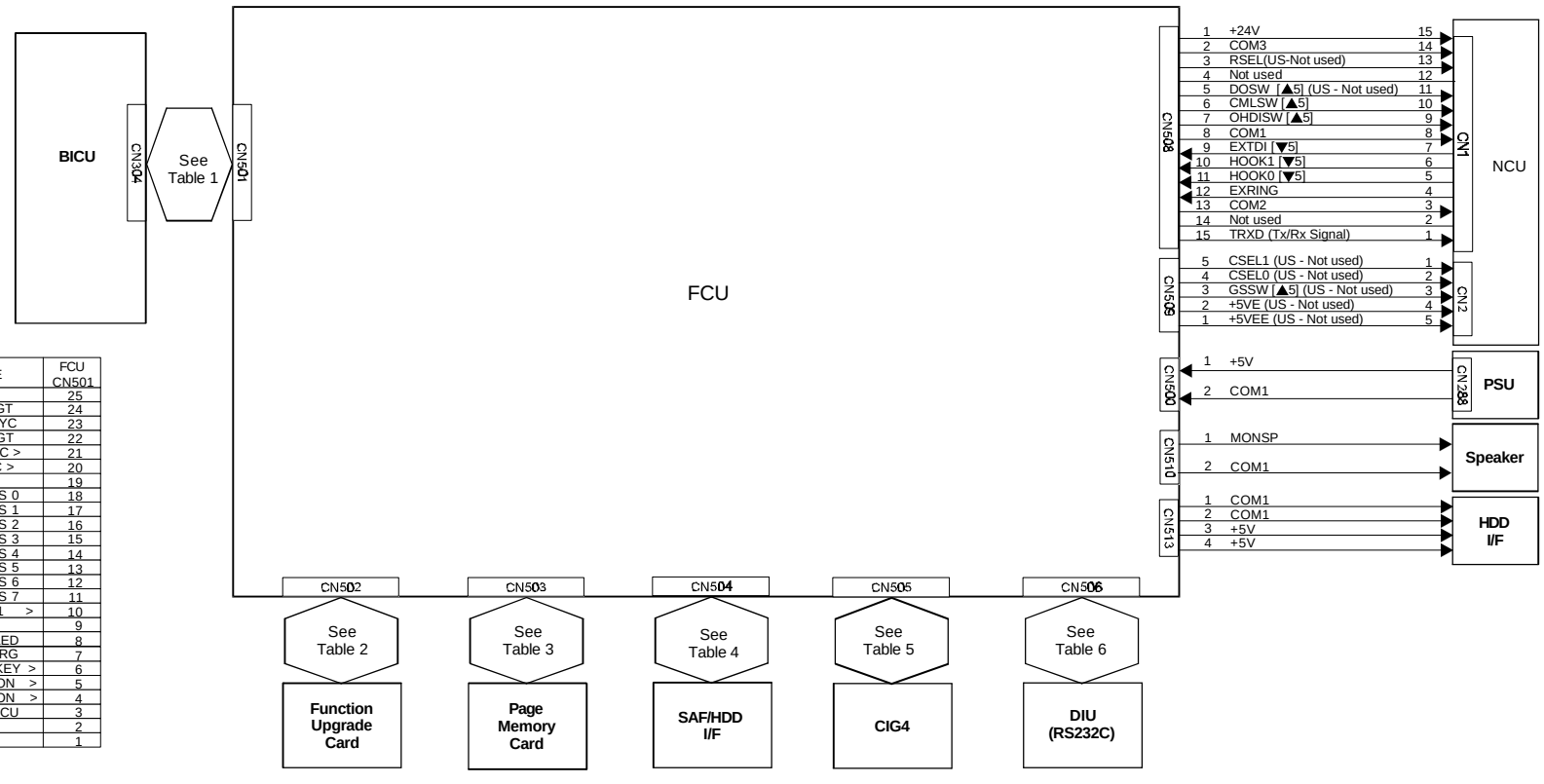


Table 1 (BICU - FCU)

BICU CN304	NAME	FCU CN501	BICU CN304	NAME	FCU CN501
1	+24V	50	26	GND	25
2	+24V	49	27	< /ARLGT	24
3	+12V	48	28	< /ARLSYC	23
4	-12V	47	29	< /ARFGT	22
5	TXD 1 >	46	30	/WRSYNC >	21
6	< RXD 2	45	31	/FSYNC >	20
7	GND	44	32	GND	19
8	/AWCLK >	43	33	< /ARKS 0	18
9	GND	42	34	< /ARKS 1	17
10	/AWLGT >	41	35	< /ARKS 2	16
11	/AWLSYC >	40	36	< /ARKS 3	15
12	/AWFGT >	39	37	< /ARKS 4	14
13	GND	38	38	< /ARKS 5	13
14	/AWKS 0 >	37	39	< /ARKS 6	12
15	/AWKS 1 >	36	40	< /ARKS 7	11
16	/AWKD 0 >	35	41	/OE 1 >	10
17	/AWKD 1 >	34	42	GND	9
18	/AWKD 2 >	33	43	< /OP-LED	8
19	/AWKD 3 >	32	44	< /RTRG	7
20	/AWKD 4 >	31	45	/OP-KEY >	6
21	/AWKD 5 >	30	46	/SW-ON >	5
22	/AWKD 6 >	29	47	/SN-ON >	4
23	/AWKD 7 >	28	48	< EX-FCU	3
24	GND	27	49	+5VE	2
25	< /ARCLK	26	50	+5VE	1

Table 2 (Function Upgrade Card - FCU)

FCU CN502	NAME	FCU CN502	NAME
1	COM1	35	COM1
2	< CPD 3 >	36	< CD1
3	< CPD 4 >	37	< CPD 11 >
4	< CPD 5 >	38	< CPD 12 >
5	< CPD 6 >	39	< CPD 13 >
6	< CPD 7 >	40	< CPD 14 >
7	/CROMCSO >	41	< CPD 15 >
8	CPA 10 >	42	/CRAMCSO >
9	/MRD >	43	N.C
10	CPA 11 >	44	< /FROMCS >
11	CPA 9 >	45	N.C
12	CPA 8 >	46	CPA 17 >
13	CPA 13 >	47	CPA 18 >
14	CPA 14 >	48	CPA 19 >
15	/MWRL >	49	CPA 20 >
16	< BSY	50	< RAMCS
17	+5V	51	+5V
18	+12VP	52	+12VP
19	CPA 16 >	53	N.C
20	CPA 15 >	54	N.C
21	CPA 12 >	55	< /WP
22	CPA 7 >	56	< /BYTE
23	CPA 6 >	57	N.C
24	CPA 5 >	58	/MWRH >
25	CPA 4 >	59	/EXCARD >
26	CPA 3 >	60	< /SLEEP
27	CPA 2 >	61	/VPCNT0 >
28	CPA 1 >	62	< /VPCNT1
29	CPA 0 >	63	< /CSCNT
30	< CPD 0 >	64	< CPD 8 >
31	< CPD 1 >	65	< CPD 9 >
32	< CPD 2 >	66	< CPD 10 >
33	RTCCS >	67	< CD2
34	COM 1	68	COM 1

Table 3 (Page Memory Card - FCU)

FCU CN503	NAME	FCU CN503	NAME
1	COM1	35	COM 1
2	< DMD 3 >	36	< CD 1
3	< DMD 4 >	37	< DMD 11 >
4	< DMD 5 >	38	< DMD 12 >
5	< DMD 6 >	39	< DMD 13 >
6	< DMD 7 >	40	< DMD 14 >
7	/RAS 4 >	41	< DMD 15 >
8	N.C	42	/RAS5 >
9	/DMRD >	43	N.C
10	N.C	44	N.C
11	DMA 9 >	45	N.C
12	DMA 8 >	46	N.C
13	N.C	47	N.C
14	N.C	48	N.C
15	/DMWR >	49	N.C
16	N.C	50	N.C
17	+5V	51	+5V
18	N.C	52	N.C
19	N.C	53	N.C
20	N.C	54	N.C
21	N.C	55	/DCAS 1 >
22	DMA 7 >	56	/DCAS 0 >
23	DMA 6 >	57	N.C
24	DMA 5 >	58	N.C
25	DMA 4 >	59	N.C
26	DMA 3 >	60	N.C
27	DMA 2 >	61	N.C
28	DMA 1 >	62	N.C
29	DMA 0 >	63	N.C
30	< DMD 0 >	64	< DMD 8 >
31	< DMD 1 >	65	< DMD 9 >
32	< DMD 2 >	66	< DMD 10 >
33	N.C	67	< CD 2
34	COM 1	68	COM 1

Table 4 (SAF/HDD interface - FCU)

FCU CN504	NAME	FCU CN504	NAME
1	COM 1	45	COM 1
2	< CPD 0 >	46	< CPD 1 >
3	< CPD 2 >	47	< CPD 3 >
4	< CPD 4 >	48	< CPD 5 >
5	< CPD 6 >	49	< CPD 7 >
6	< CPD 8 >	50	< CPD 9 >
7	< CPD 10 >	51	< CPD 11 >
8	< CPD 12 >	52	< CPD 13 >
9	+5V	53	< CPD 14 >
10	< CPD 10 >	54	/MRD >
11	< DMD 15 >	55	/MWRH >
12	/MWRL >	56	COM 1
13	CPA 1 >	57	CPA 2 >
14	CPA 3 >	58	CPA 4 >
15	+5V	59	CPA 5 >
16	CPA 6 >	60	CPA 7 >
17	< DMD 14 >	61	CPA 8 >
18	CPA 9 >	62	CPA 10 >
19	CPA 11 >	63	COM 1
20	CPA 12 >	64	CPA 13 >
21	CPA 14 >	65	CPA 15 >
22	/FROMCS >	66	/SRAMCS >
23	RTCCS >	67	< /INTHDD
24	+12V	68	< DMD 0 >
25	DMD 13 >	69	< DMD 1 >
26	< DMD 2 >	70	< DMD 3 >
27	< /EXCARD	71	< DMD 4 >
28	< DMD 5 >	72	< DMD 6 >
29	< DMD 7 >	73	COM 1
30	< DMD 8 >	74	< DMD 9 >
31	< DMD 10 >	75	< DMD 11 >
32	+5VD	76	/RAS 0 >
33	/CAS0 >	77	/CAS 1 >
34	/DMMRD >	78	/DMMWR >
35	< DMD 12 >	79	/HDCS >
36	/DMIORD >	80	/RESET >
37	+5V	81	/DMIOWR >
38	DMA 1 >	82	DMA 2 >
39	DMA 3 >	83	DMA 4 >
40	DMA 5 >	84	DMA 6 >
41	DMA 7 >	85	DMA 8 >
42	DMA 9 >	86	DMA 10 >
43	HDDACK >	87	DMA 11 >
44	COM 1	88	COM 1

Table 5 (CIG4 - FCU)

FCU CN505	NAME	FCU CN505	NAME
1	VTXMD >	21	CPA 3 >
2	< VRXMDM	22	CPA 2 >
3	COM3	23	CPA 1 >
4	-12V	24	CPA 0 >
5	/G4CS >	25	COM 3
6	/RESET >	26	< CPD 7 >
7	COM3	27	< CPD 6 >
8	< /INTG4	28	< CPD 5 >
9	< /CWAIT	29	< CPD 4 >
10	/CODCCS >	30	< CPD 3 >
11	CPA 14 >	31	< CPD 2 >
12	CPA 13 >	32	< CPD 1 >
13	CPA 12 >	33	< CPD 0 >
14	CPA 10 >	34	/MWRL >
15	CPA 9 >	35	N.C
16	CPA 8 >	36	/MRD >
17	CPA 7 >	37	COM 3
18	CPA 6 >	38	+24V
19	CPA 5 >	39	COM 3
20	CPA 4 >	40	+24V

Table 6 (DIU (RS232C) - FCU)

FCU CN506	NAME	FCU CN506	NAME
1	< CPD 0 >	13	< CPD 6 >
2	< CPA 0 >	14	/IOWR >
3	< CPD 1 >	15	< CPD 7 >
4	< CPA 1 >	16	/RST232 >
5	< CPD 2 >	17	< IOIT2
6	< CPA 2 >	18	/R232CS >
7	< CPD 3 >	19	N.C
8	< CPA 3 >	20	N.C
9	< CPD 4 >	21	+5V
10	N.C	22	N.C
11	< CPD 5 >	23	COM 1
12	/IORD >	24	N.C

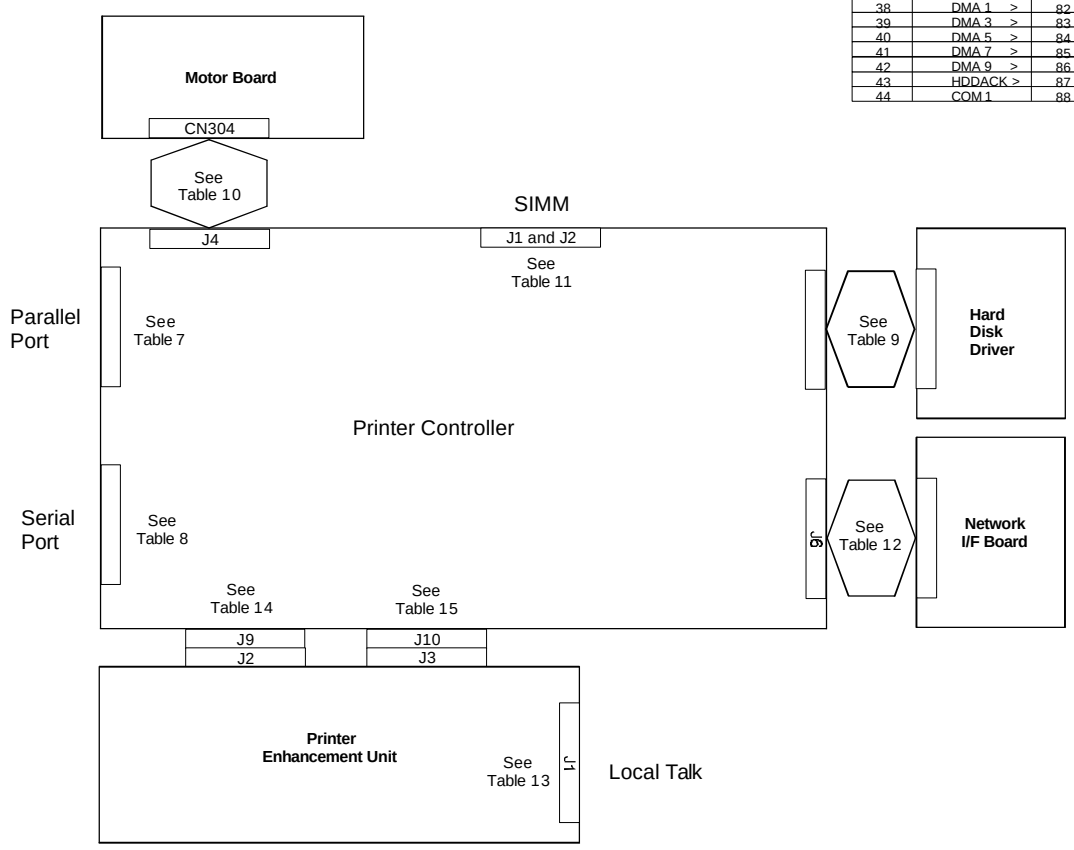


Table 7 (Parallel Porl - Printer Controller)

PIN	NAME
1	< /STROBE
2	< DATA BIT 0 >
3	< DATA BIT 1 >
4	< DATA BIT 2 >
5	< DATA BIT 3 >
6	< DATA BIT 4 >
7	< DATA BIT 5 >
8	< DATA BIT 6 >
9	< DATA BIT 7 >
10	/ACKNLG >
11	BUSY >
12	PE >
13	SLCK >
14	< /AUTO FEED XT
15	NC
16	GND
17	GND
18	NC
19~30	GND
31	< /INIT
32	/ERROR >
33	GND
34	NC
35	NC
36	< /SLCT IN

Table 8 (Serial Porl - Printer Controller)

PIN	NAME
2	STXD >
3	< SRXD
4	+10V >
6	< SDSR
20	SDTR >

Table 9 (Hard Disk Driver - Printer Controller)

PIN	NAME	PIN	NAME
1	CPURST >	26	GND
2	GND	27	CHRDY (5V)
3	< DATA 7 >	28	GND
4	< DATA 8 >	29	NC
5	< DATA 6 >	30	GND
6	< DATA 9 >	31	< HDDINT
7	< DATA 5 >	32	NC
8	< DATA 10 >	33	ADDRESS 3 >
9	< DATA 4 >	34	NC
10	< DATA 11 >	35	ADDRESS 2 >
11	< DATA 3 >	36	ADDRESS 4 >
12	< DATA 12 >	37	/ HDDCS0 >
13	< DATA 2 >	38	/ HDDCS1 >
14	< DATA 13 >	39	NC
15	< DATA 1 >	41	+5V
16	< DATA 14 >	42	+5V
17	< DATA 0 >	44	NC
18	< DATA 15 >	47	NC
19	GND	48	NC
20	NC	49	NC
21	NC	50	NC
22	GND		
23	< / IOWR		
24	GND		
25	< /IORD		

Table 10 (Motor Board - Printer Controller)

PIN	NAME
A1	< / EBD
A2	/ CVDO >
A3	< / EVSYNC
A4	< / ESTS
A5	ECMD >
A6~10	+5V
B1~3	NC
B4	< / ESBSY
B5	/ ECBSY >
B6~10	GND

Table 11 (SIMM - Printer Controller)

PIN	NAME	PIN	NAME
1	GND	37	NC
2	< DATA 0 >	38	NC
3	< DATA 16 >	39	GND
4	< DATA 1 >	40	CAS 0 >
5	< DATA 17 >	41	CAS 2 >
6	< DATA 2 >	42	CAS 3 >
7	< DATA 18 >	43	CAS 1 >
8	< DATA 3 >	44	RAS 0 >
9	< DATA 19 >	45	RAS 1 >
10	+5V	46	NC
11	NC	47	/ WE >
12	ADDRESS 0 >	48	NC
13	ADDRESS 1 >	49	< DATA 8 >
14	ADDRESS 2 >	50	< DATA 24 >
15	ADDRESS 3 >	51	< DATA 9 >
16	ADDRESS 4 >	52	< DATA 25 >
17	ADDRESS 5 >	53	< DATA 10 >
18	ADDRESS 6 >	54	< DATA 26 >
19	ADDRESS 10>	55	< DATA 11 >
20	< DATA 4 >	56	< DATA 27 >
21	< DATA 40 >	57	< DATA 12 >
22	< DATA 5 >	58	< DATA 28 >
23	< DATA 21 >	59	+5V
24	< DATA 6 >	60	< DATA 29 >
25	< DATA 22 >	61	< DATA 13 >
26	< DATA 7 >	62	< DATA 30 >
27	< DATA 23 >	63	< DATA 14 >
28	ADDRESS 7 >	64	< DATA 31 >
29	NC	65	< DATA 15 >
30	+5V	66	NC
31	ADDRESS 8 >	67	NC
32	ADDRESS 9 >	68	NC
33	RAS 3 >	69	NC
34	RAS 2 >	70	NC
35	NC	71	NC
36	NC	72	GND

Table 12 (Network I/F Board - Printer Controller)

PIN	NAME	PIN	NAME
1	NC	27	ADDRESS 4 >
2	+5V	28	ADDRESS 5 >
3	GND	29	ADDRESS 6 >
4	< DATA 0 >	30	ADDRESS 7 >
5	< DATA 1 >	31	ADDRESS 8 >
6	< DATA 2 >	32	ADDRESS 9 >
7	< DATA 3 >	33	ADDRESS 10 >
8	< DATA 4 >	34	ADDRESS 11 >
9	< DATA 5 >	35	ADDRESS 12 >
10	< DATA 6 >	36	ADDRESS 13 >
11	< DATA 7 >	37	ADDRESS 14 >
12	< DATA 8 >	38	ADDRESS 15 >
13	< DATA 9 >	39	GND
14	< DATA 10 >	40	GND
15	+5V	41	< / XNICID
16	+5V	42	< / NICINT
17	< DATA 11 >	43	/ PNTIRQ >
18	< DATA 12 >	44	/ BHE >
19	< DATA 13 >	45	< / NICREQ
20	< DATA 14 >	46	/ NICACK >
21	< DATA 15 >	47	/ IOWR >
22	GND	48	/ NICCS >
23	ADDRESS 0 >	49	/ IORD >
24	ADDRESS 1 >	50	< / RDY
25	ADDRESS 2 >	51	CPURST >
26	ADDRESS 3 >	52	CLK2 >

Table 13 (Local Talk - Printer Enhancement Unit)

PIN	NAME
1	GND
2	< HSK
3	TXD- >
4	GND
5	< RXD-
6	TXD+ >
7	NC
8	< RXD+

Table 14 (Printer Enhancement Unit - Printer Controller)

PIN	NAME	PIN	NAME	PIN	NAME
A1	< DATA16 >	B1	< DATA17 >	C1	< DATA18 >
A2	< DATA19 >	B2	< DATA20 >	C2	< DATA21 >
A3	< DATA22 >	B3	< DATA23 >	C3	< DATA24 >
A4	< DATA25 >	B4	+ 5V	C4	GND
A5	GND	B5	< SCCCS	C5	< /ROMCS 1
A6	< ADDRESS 0	B6	< ADDRESS 1	C6	< ADDRESS 2
A7	< ADDRESS 3	B7	< ADDRESS 4	C7	< ADDRESS 5
A8	< ADDRESS 6	B8	< ADDRESS 7	C8	< ADDRESS 8
A9	+ 5V	B9	GND	C9	< ADDRESS 9
A10	< ADDRESS 10	B10	< ADDRESS 11	C10	< ADDRESS 12
A11	< ADDRESS 13	B11	< ADDRESS 14	C11	< ADDRESS 15
A12	< ADDRESS 16	B12	+ 5V	C12	GND
A13	< ADDRESS 17	B13	< ADDRESS 18	C13	< ADDRESS 19
A14	< ADDRESS 20	B14	< ADDRESS 21	C14	< ADDRESS 22
A15	< ADDRESS 23	B15	< ADDRESS 24	C15	+ 5V
A16	GND	B16	< ADDRESS 25	C16	< ADDRESS 26
A17	< ADDRESS 27	B17	< ADDRESS 28	C17	< ADDRESS 29
A18	< ADDRESS 30	B18	< ADDRESS 31	C18	GND
A19	GND	B19	< /ALE	C19	< /DEN
A20	< /BLAST	B20	< /W/R	C20	< CPURST
A21	+ 5V	B21	GND	C21	+ 5V
A22	/ARAMWR >	B22	/ARAMOE >	C22	AMA 0 >
A23	AMA 1 >	B23	AMA 2 >	C23	AMA 3 >
A24	AMA 4 >	B24	AMA 5 >	C24	AMA 6 >
A25	AMA 7 >	B25	AMA 8 >	C25	AMA 9 >
A26	AMA 10 >	B26	< ALE	C26	/ACAS 0 >
A27	/ACAS 1 >	B27	ACAS 2 >	C27	/ACAS 3 >
A28	+ 5V	B28	GND	C28	GND
A29	+ 5V	B29	/ARAS 0 >	C29	/ARAS 1 >
A30	/ARAS 2 >	B30	/ARAS 3 >	C30	/ARAS 4 >
A31	/ARAS 5 >	B31	/ARAS 6 >	C31	+ 5V
A32	+ 5V	B32	GND	C32	GND

Table 15 (Printer Enhancement Unit - Printer Controller)

PIN	NAME	PIN	NAME	PIN	NAME
A1	< DATA 0 >	B1	< DATA 1 >	C1	< DATA 2 >
A2	< DATA 3 >	B2	< DATA 4 >	C2	GND
A3	GND	B3	< DATA 5 >	C3	< DATA 6 >
A4	< DATA 7 >	B4	< DATA 8 >	C4	+ 5V
A5	GND	B5	< DATA 9 >	C5	< DATA 10 >
A6	< DATA 11 >	B6	< DATA 12	C6	GND
A7	GND	B7	< DATA 13 >	C7	< DATA 14 >
A8	< DATA 15 >	B8	+ 5V	C8	GND
A9	GND	B9	< DATA 26 >	C9	< DATA 27 >
A10	< DATA 28 >	B10	< DATA 29 >	C10	< DATA 30 >
A11	< DATA 31 >	B11	GND	C11	+ 5V
A12	+ 5V	B12	GND	C12	< /D5BREQ
A13	< /D5BACK	B13	/SCCREQ >	C13	NC
A14	+ 5V	B14	GND	C14	GND
A15	+ 5V	B15	/SOO1INT >	C15	/SCCINT >
A16	+ 5V	B16	GND	C16	GND
A17	GND	B17	+ 5V	C17	< /RDY
A18	< CLK 2	B18	GND	C18	GND
A19	+ 5V	B19	+ 5V	C19	< /IORD
A20	< /IOWR	B20	< /DRAMOE	C20	< /ORAMWR
A21	+ 5V	B21	+ 5V	C21	< DMA 0
A22	< DMA 1	B22	< DMA 2	C22	< DMA 3
A23	< DMA 4	B23	< DMA 5	C23	< DMA 6
A24	< DMA 7	B24	< DMA 8	C24	< DMA 9
A25	< DMA 10	B25	< DMA 11	C25	GND
A26	GND	B26	< /DCAS 0	C26	< /DCAS 1
A27	< /DCAS 2	B27	< /DCAS 3	C27	+ 5V
A28	GND	B28	< /DRAS 0	C28	< /DRAS 1
A29	< /DRAS 2	B29	< /DRAS 3	C29	< /DRAS 4
A30	< /DRAS 5	B30	< /DRAS 6	C30	< /DRAS 7
A31	< /DRAS 8	B31	< /DRAS 9	C31	+ 5V
A32	+ 5V	B32	GND	C32	GND

IMPORTANT SAFETY NOTICES ..... **?**

OVERALL MACHINE INFORMATION ..... **?**
1. SPECIFICATIONS 1-1 1-1
2. MACHINE CONFIGURATION 1-4 1-4
3. PAPER PATH 1-5 1-5
4. MECHANICAL COMPONENT LAYOUT 1-6 1-6
5. ELECTRICAL COMPONENT DESCRIPTIONS 1-8 1-8
6. DRIVE LAYOUT 1-11 1-11
7. COPY PROCESS 1-12 1-12
7.1 OVERVIEW 1-12 1-12
8. BOARD STRUCTURE 1-14 1-14
8.1 OVERVIEW 1-14 1-14
8.2 DESCRIPTION 1-15 1-15

DETAILED SECTION DESCRIPTIONS ..... **?**
1. SCANNING 2-1 2-1
1.1 OVERVIEW 2-1 2-1
1.2 SCANNER DRIVE 2-2 2-2
1.3 ORIGINAL SIZE DETECTION IN PLATEN MODE 2-3 2-3
2. IMAGE PROCESSING 2-5 2-5
2.1 OVERVIEW 2-5 2-5
2.2 SBU (SENSOR BOARD UNIT) 2-6 2-6
2.3 AUTO IMAGE DENSITY (ADS) 2-7 2-7
2.4 IPU (IMAGE PROCESSING UNIT) 2-8 2-8
2.4.1 Overview 2-8 ..... *2-8*
2.4.2 Image Processing Path 2-9 ..... *2-9*
2.4.3 Auto Shading 2-10 ..... *2-10*
2.4.4 Filtering and Main Scan Magnification/Reduction 2-11 ..... *2-11*
2.4.5 Gamma (g) Correction 2-13 ..... *2-13*
2.4.6 Gradation Processing 2-13 ..... *2-13*
2.4.7 Line Width Correction 2-15 ..... *2-15*
2.5 MSU (MEMORY SUPER-CHARGER UNIT) 2-16 2-16
2.6 FCI (FINE CHARACTER AND IMAGE) 2-17 2-17
3. LASER EXPOSURE 2-18 2-18
3.1 OVERVIEW 2-18 2-18
3.2 OPTICAL PATH 2-19 2-19
3.3 GRADATION CONTROL (LASER POWER MODULATION) 2-20 2-20
3.4 AUTO POWER CONTROL (APC) 2-21 2-21
3.5 LD SAFETY SWITCHES 2-22 2-22
4. PCU (PHOTOCONDUCTOR UNIT) 2-23 2-23
4.1 OVERVIEW 2-23 2-23
4.2 DRIVE MECHANISM 2-24 2-24
4.3 NEW PCU DETECTION MECHANISM 2-25 2-25
4.4 DRUM CHARGE 2-26 2-26
4.4.1 Overview 2-26 ..... *2-26*
4.4.2 Charge Roller Contact Mechanism 2-27 ..... *2-27*
4.4.3 Drum Charge Roller Cleaning 2-28 ..... *2-28*
4.4.4 Temperature Compensation 2-29 ..... *2-29*
4.5 DEVELOPMENT 2-30 2-30
4.5.1 Overview 2-30 ..... *2-30*
4.5.2 Drive Mechanism 2-31 ..... *2-31*
4.5.3 Mixing 2-32 ..... *2-32*
4.5.4 Development Bias 2-33 ..... *2-33*
4.5.5 Toner Density Control 2-34 ..... *2-34*
4.5.6 Toner Supply in Abnormal sensor Conditions 2-37 ..... *2-37*
4.5.7 Toner Supply 2-38 ..... *2-38*
4.6 DRUM CLEANING AND TONER RECYCLING 2-42 2-42
4.6.1 Drum Cleaning 2-42 ..... *2-42*
4.6.2 Toner Recycling 2-43 ..... *2-43*
5. PAPER FEED 2-44 2-44
5.1 OVERVIEW 2-44 2-44
5.2 PAPER TRAY 2-45 2-45
5.2.1 Paper Feed Drive Mechanism 2-45 ..... *2-45*
5.2.2 Paper Lift Mechanism 2-46 ..... *2-46*
5.2.3 Paper End Detection 2-47 ..... *2-47*
5.2.4 Side Fence Double Stopper Mechanism 2-48 ..... *2-48*
5.2.5 Paper Size Detection 2-49 ..... *2-49*
5.3 BY-PASS FEED 2-50 2-50
5.3.1 Overview 2-50 ..... *2-50*
5.3.2 Paper Feed Mechanism and Paper End Detection 2-51 ..... *2-51*

5.3.3 By-pass Feed Paper Width Detection 2-52 ..... *2-52*
5.4 PAPER REGISTRATION 2-53 2-53
6. IMAGE TRANSFER AND PAPER SEPARATION 2-54 2-54
6.1 OVERVIEW 2-54 2-54
6.2 IMAGE TRANSFER AND PAPER SEPARATION MECHANISM 2-55 2-55
6.3 ROLLER CLEANING 2-56 2-56
6.4 PAPER SEPARATION AND TRANSPORTATION 2-57 2-57
7. IMAGE FUSING 2-58 2-58
7.1 OVERVIEW 2-58 2-58
7.2 FUSING DRIVE AND RELEASE MECHANISM 2-59 2-59
7.3 FUSING ENTRANCE GUIDE SHIFT MECHANISM 2-60 2-60
7.4 PRESSURE ROLLER 2-61 2-61
7.5 CLEANING MECHANISM 2-61 2-61
7.6 FUSING TEMPERATURE CONTROL 2-62 2-62
7.7 OVERHEAT PROTECTION 2-62 2-62
8. ENERGY SAVER MODES 2-63 2-63
8.1 OVERVIEW 2-63 2-63
8.2 COPIER ONLY 2-64 2-64
8.3 COPIER/PRINTER 2-66 2-66
8.4 COPIER/FAX, COPIER/PRINTER/FAX 2-68 2-68
8.5 ENERGY SAVER CONTROL 2-71 2-71
8.6 ENERGY SAVER TIMING CHARTS 2-73 2-73
9. PAPER EXIT 2-75 2-75

INSTALLATION ..... ?
1. INSTALLATION REQUIREMENTS 3-1 3-1
1.1 ENVIRONMENT 3-1 3-1
1.2 MACHINE LEVEL 3-1 3-1
1.3 MINIMUM SPACE REQUIREMENTS 3-2 3-2
1.4 POWER REQUIREMENTS 3-2 3-2
2. COPIER INSTALLATION 3-3 3-3
2.1 ACCESSORY CHECK 3-3 3-3
2.2 COPIER INSTALLATION PROCEDURE 3-4 3-4
2.3 AUTO DOCUMENT FEEDER INSTALLATION 3-8 3-8
2.4 PAPER TRAY UNIT INSTALLATION 3-10 3-10
2.5 DUPLEX UNIT INSTALLATION 3-13 3-13
2.6 1-BIN SORTER INSTALLATION 3-16 3-16
2.7 MEMORY BOARD 3-18 3-18
2.8 KEY COUNTER HOLDER INSTALLATION 3-19 3-19
2.9 ANTI-CONDENSATION HEATER INSTALLATION 3-21 3-21
2.10 TRAY HEATER 3-22 3-22
2.11 TRAY HEATER (OPTIONAL PAPER TRAY UNIT) 3-23 3-23

SERVICE TABLES ..... ?
1. SERVICE REMARKS 4-1 4-1
1.1 GENERAL CAUTION 4-1 4-1
1.2 PCU 4-1 4-1
1.3 TRANSFER ROLLER UNIT 4-2 4-2
1.4 SCANNER UNIT 4-2 4-2
1.5 LASER UNIT 4-2 4-2
1.6 FUSING UNIT 4-2 4-2
1.7 PAPER FEED 4-3 4-3
1.8 OTHERS 4-3 4-3
2. SERVICE PROGRAM MODE 4-4 4-4
2.1 SERVICE PROGRAM MODE OPERATION 4-4 4-4
2.1.1 Service Program Access Procedure 4-4 ..... *4-4*
2.1.2 Accessing Copy Mode from within an SP Mode 4-4 ..... *4-4*
2.1.3 How to select the program number 4-5 ..... *4-5*
2.1.4 To Input a Value or Setting for an SP Mode 4-5 ..... *4-5*
2.2 SERVICE PROGRAM MODE TABLES 4-6 4-6
2.2.1 Main SP Mode Table 4-6 ..... *4-6*
2.2.2 Test Pattern Printing (SP 5-902) 4-32 ..... *4-32*
2.2.3 Input Check (SP5-803) 4-33 ..... *4-33*
2.2.4 Output Check (SP5-804) 4-36 ..... *4-36*
2.2.5 Copy Jam History Display (SP7-903) 4-38 ..... *4-38*
2.2.6 Original Jam History Display (SP7-905) 4-39 ..... *4-39*
2.2.7 System Parameter And Data Lists (SP5-992) 4-39 ..... *4-39*
2.2.8 Memory All Clear (SP5-801) 4-40 ..... *4-40*
2.2.9 Program Download 4-41 ..... *4-41*
3. USER PROGRAM MODE 4-42 4-42
3.1 HOW TO ENTER AND EXIT UP MODE 4-42 4-42
4. SWITCHES/LEDS 4-44 4-44
4.1 SWITCHES 4-44 4-44

4.2 LEDS 4-44 4-44
4.3 TEST PIN 4-44 4-44
5. SPECIAL TOOLS AND LUBRICANTS 4-44 4-44
5.1 SPECIAL TOOLS 4-44 4-44

PREVENTIVE MAINTENANCE ..... ?
1. PREVENTIVE MAINTENANCE SCHEDULE 5-1 5-1
1.1 PM TABLE 5-1 5-1

REPLACEMENT AND ADJUSTMENT ..... ?
1. EXTERIOR 6-1 6-1
1.1 FRONT COVER/INNER COVER 6-1 6-1
1.2 REAR COVER 6-2 6-2
1.3 LEFT/RIGHT COVER 6-2 6-2
1.4 EXPOSURE GLASS/OPERATION PANEL/UPPER COVER 6-3 6-3
2. PHOTOCONDUCTOR UNIT (PCU) 6-4 6-4
2.1 PCU 6-4 6-4
2.2 DRUM CHARGE ROLLER UNIT 6-6 6-6
2.3 DRUM 6-7 6-7
2.4 CLEANING BLADE 6-8 6-8
3. TRANSFER UNIT 6-9 6-9
3.1 TRANSFER UNIT 6-9 6-9
3.2 TRANSFER ROLLER/SEPARATION UNIT 6-9 6-9
4. SCANNER UNIT 6-10 6-10
4.1 LENS COVER 6-10 6-10
4.2 SCANNER FRAME 6-11 6-11
4.3 ORIGINAL SIZE SENSOR 6-12 6-12
4.4 LENS BLOCK/SBU ASSEMBLY 6-12 6-12
4.5 XENON LAMP 6-13 6-13
4.6 SCANNER H. P. SENSOR/PLATEN COVER SENSOR 6-14 6-14
4.7 SCANNER MOTOR 6-15 6-15
4.8 SCANNER WIRE 6-16 6-16
5. LASER UNIT 6-18 6-18
5.1 LASER UNIT/MAIN SCAN SYNCHRONIZATION DETECTOR 6-19 6-19
DETECTOR 6-19 6-19
5.2 POLYGON MIRROR MOTOR 6-20 6-20
5.3 LD UNIT 6-21 6-21
5.4 LASER UNIT POSITIONING ADJUSTMENT 6-22 6-22
6. FUSING/EXIT 6-23 6-23
6.1 HOT ROLLER STRIPPERS 6-23 6-23
6.2 FUSING THERMISTOR/THERMOFUSE 6-23 6-23
6.3 HOT ROLLER/FUSING LAMP 6-24 6-24
6.4 PRESSURE ROLLER/CLEANING ROLLER 6-25 6-25
7. EXIT 6-26 6-26
7.1 EXIT UNIT 6-26 6-26
7.2 UPPER EXIT SENSOR/LOWER EXIT SENSOR 6-27 6-27
8. PAPER FEED/ REGISTRATION 6-28 6-28
8.1 BY-PASS FEED TRAY 6-28 6-28
8.2 BY-PASS FEED PAPER END SENSOR/REGISTRATION SENSOR 6-29 6-29
8.3 PAPER FEED ROLLER/FRICTION PAD 6-30 6-30
8.4 BY-PASS FEED PAPER WIDTH SENSOR 6-30 6-30
8.5 PAPER FEED ROLLERS/PAPER SIZE DETECTOR 6-31 6-31
8.5.1 Paper Feed Rollers 6-31 6-31
8.5.2 Paper Size Detector 6-31 6-31
8.6 PAPER END SENSORS 6-32 6-32
8.7 PAPER FEED CLUTCHES/RELAY CLUTCHES 6-33 6-33
8.8 RELAY SENSOR/RIGHT VERTICAL GUIDE SWITCH 6-34 6-34
9. OTHERS 6-35 6-35
9.1 IOCSS BOARD 6-35 6-35
9.2 MSU BOARD/BICU BOARD 6-36 6-36
9.3 PSU BOARD 6-37 6-37
10. STANDARD WHITE DENSITY ADJUSTMENT 6-38 6-38
11. COPY ADJUSTMENT PRINTING/SCANNING 6-39 6-39
11.1 PRINTING 6-39 6-39
11.1.1 Registration - Leading Edge/Side-to-Side 6-39 6-39
11.1.2 Blank Margin 6-40 6-40
11.1.3 Main Scan Magnification 6-40 6-40
11.1.4 Double Copy Registration 6-41 6-41
11.2 SCANNING 6-41 6-41
11.2.1 Registration: Platen Mode 6-41 6-41
11.2.2 Magnification 6-42 6-42
11.3 ADF IMAGE ADJUSTMENT 6-43 6-43

11.3.1 Registration and Blank Margin 6-43 6-43
11.3.2 Sub Scan Magnification 6-43 6-43
12. IMAGE DENSITY ADJUSTMENT BY KEY OPERATOR 6-44 6-44

TROUBLESHOOTING ..... ?
1. SERVICE CALL CONDITIONS 7-1 7-1
2. SC CODE DESCRIPTIONS 7-2 7-2
3. ELECTRICAL COMPONENT DEFECTS 7-11 7-11
3.1 SENSORS 7-11 7-11
3.2 SWITCHES 7-13 7-13
4. BLOWN FUSE CONDITIONS 7-13 7-13

ELECTRICAL COMPONENT LAYOUT

Point-to-Point Diagram

ADAM (A193)

PARTS CATALOG

First Edition September 1996

PARTS CATALOG

INTRODUCTION

This chapter instructs you the numbers and names of parts on this machine.

INDEX to PARTS CATALOG

ADAM (A193)
DF43 (A628)
PS330 (G697)
AD330 (G694)
PT200 (A629)
FAX Unit/ISDN Unit (A639/A644)
Printer Control Unit (A643)

ADAM (A193)

PARTS CATALOG

INTRODUCTION

This chapter instructs you the numbers and names of parts on this machine.

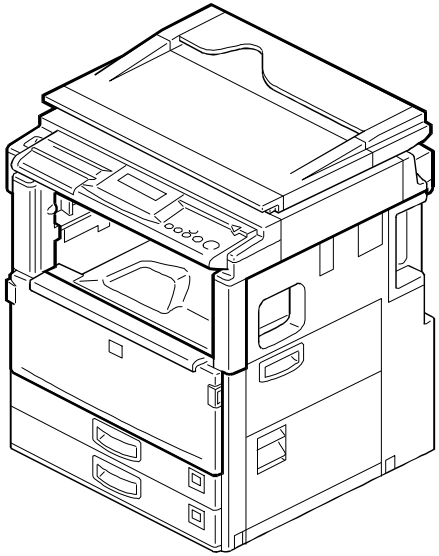
INDEX to PARTS CATALOG

Location of unit..... 2
1.Exterior 1 (A193) 6
2.Exterior 2 (A193) 8
3.Platen Cover (A193)..... 10
4.Operation Panel (A193)..... 12
5.By-pass Feed Table (A193)..... 14
6.Paper Tray (A193)..... 16
7.Resistration (A193)..... 18
8.Paper Feed Section (A193)..... 20
9.Optics Section 1(A193)..... 22
10.Optics Section 2 (A193)..... 24
11.Laser Unit (A193) 26
12.Toner Hopper Unit (A193) 28
13.P.C.U. (A193) 30
14.Fusing Unit (A193)..... 32
15.Paper Exit Section (A193) 34
16.Transport Section 1 (A193) 36
17.Transport Section 2 (A193) 38
18.Drive Section 1 (A193) 40
19.Drive Section 2 (A193) 42
20.Electrical Section 1 (A193) 44
21.Electrical Section 2 (A193) 46
22.Frame Section 1 (A193) 48
23.Frame Section 2 (A193) 50
24.BICU Board (A193)..... 52
25.IOCSS Board (A193)..... 58
26.Decal and Document (A193) 62
27.Special Tools (A193) 64
Parts Index 67

September,10 '96

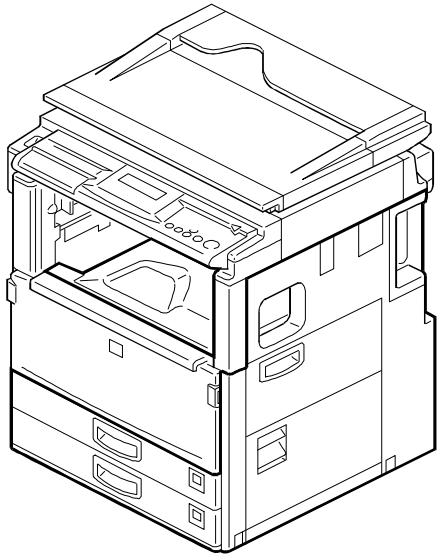
Location of unit

1. Exterior 1 (A193)



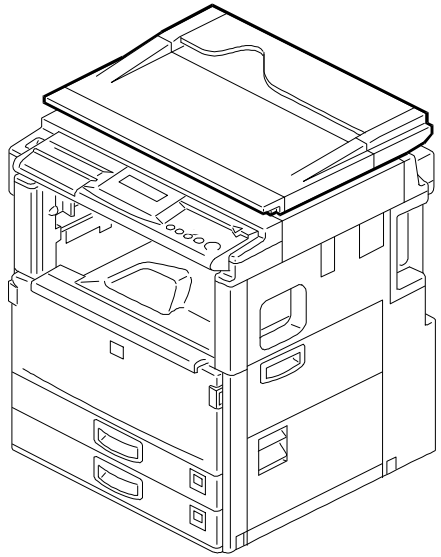
See Page 6

2. Exterior 2 (A193)



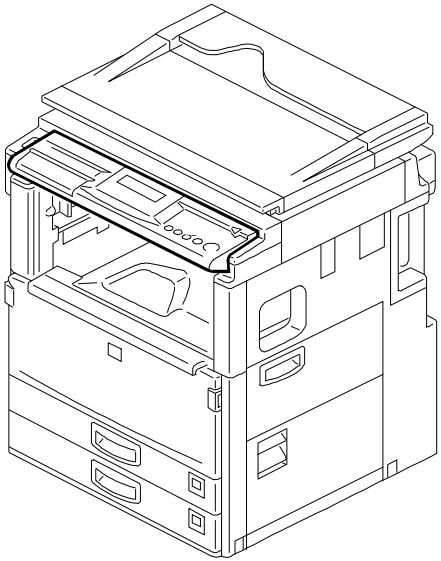
See Page 8

3. Platen Cover (A193)



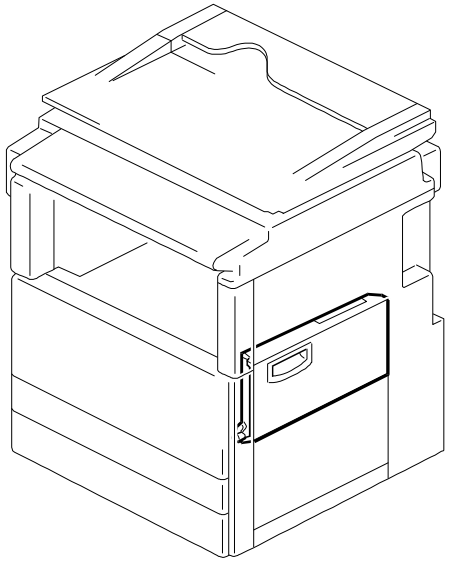
See Page 10

4. Operation Panel (A193)



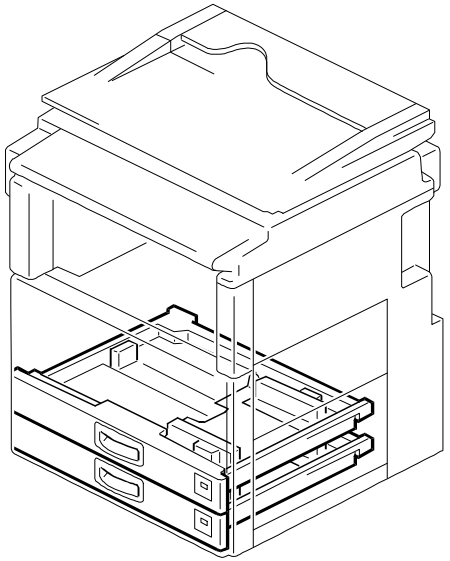
See Page 12

5. By-pass Feed Table (A193)



See Page 14

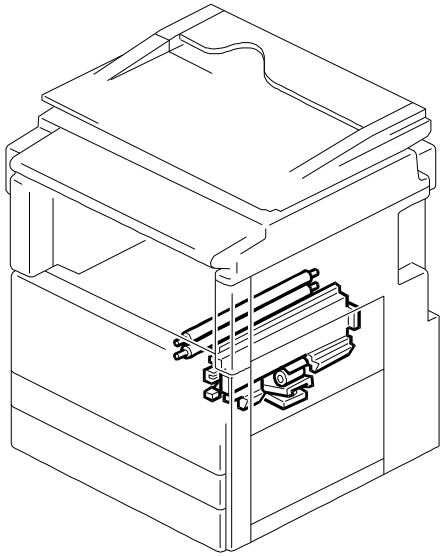
6. Paper Tray (A193)



See Page 16

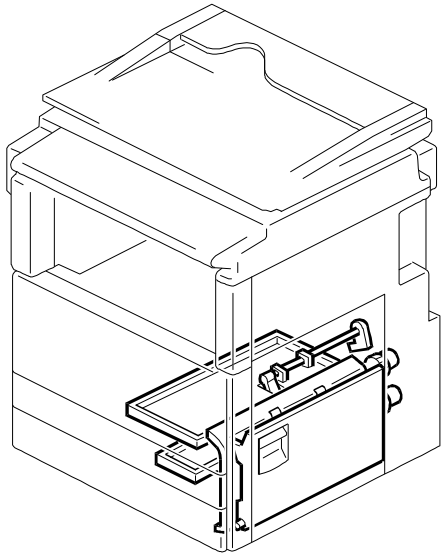
Location of unit

7. Resistration (A193)



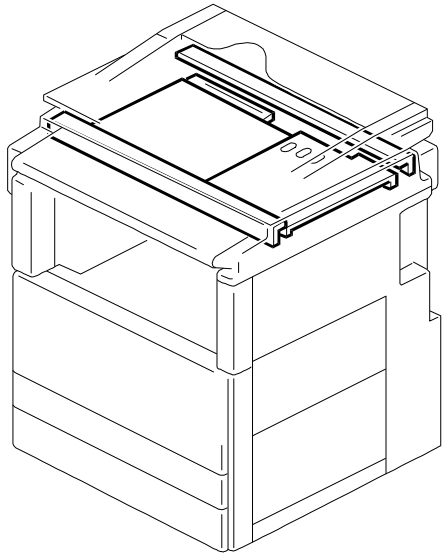
See Page 18

8. Paper Feed Section (A193)



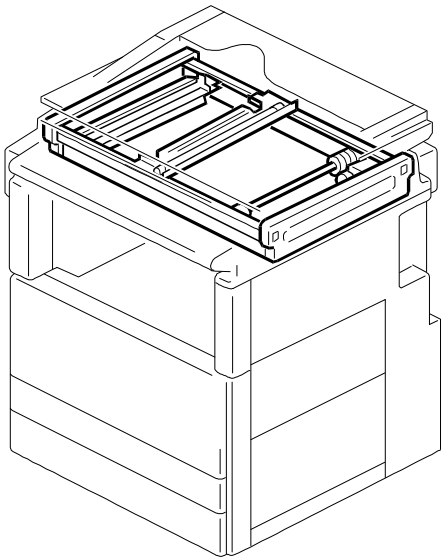
See Page 20

9. Optics Section 1(A193)



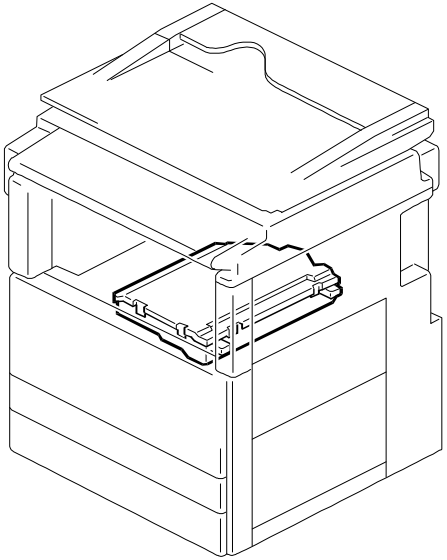
See Page 22

10. Optics Section 2 (A193)



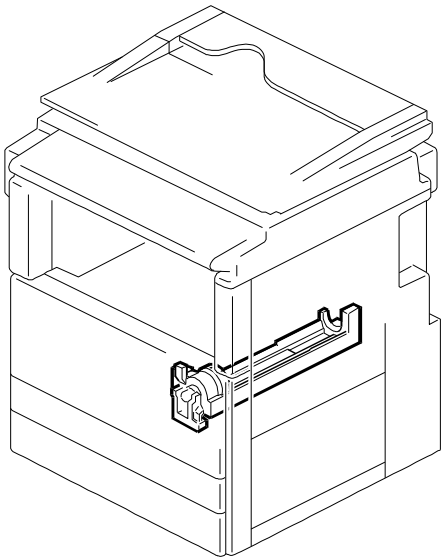
See Page 24

11. Laser Unit (A193)



See Page 26

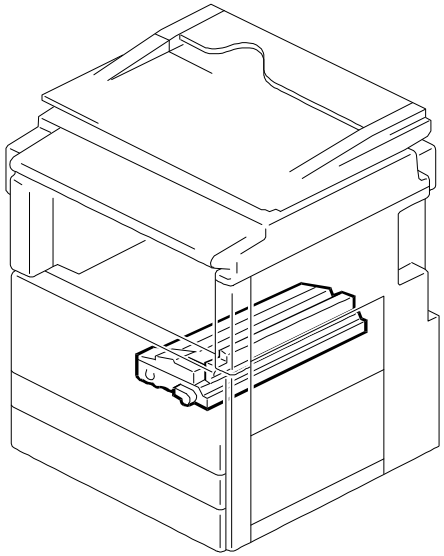
12. Toner Hopper Unit (A193)



See Page 28

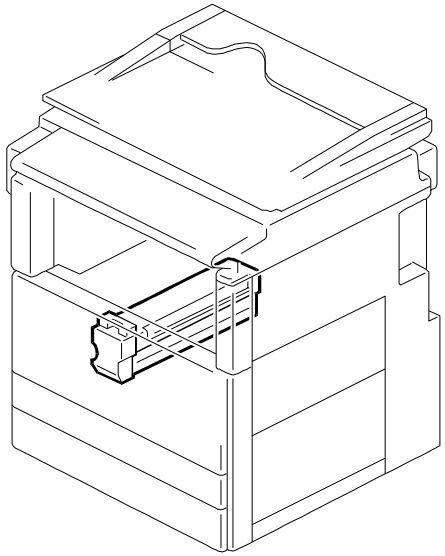
Location of unit

13. P.C.U. (A193)



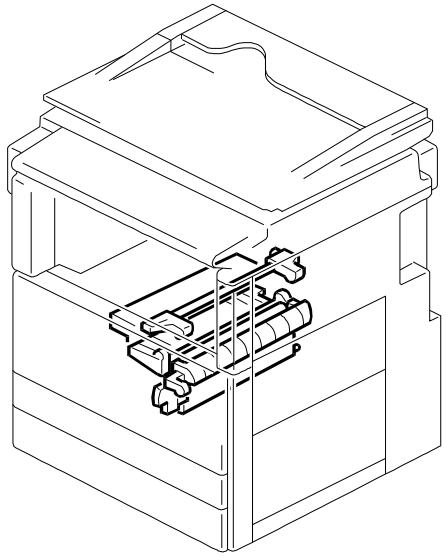
See Page 30

14. Fusing Unit (A193)



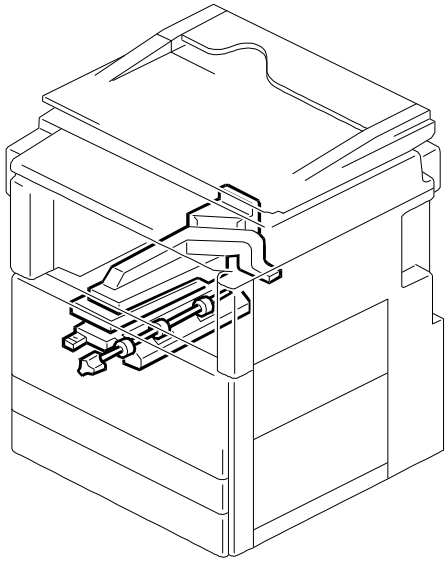
See Page 32

15. Paper Exit Section (A193)



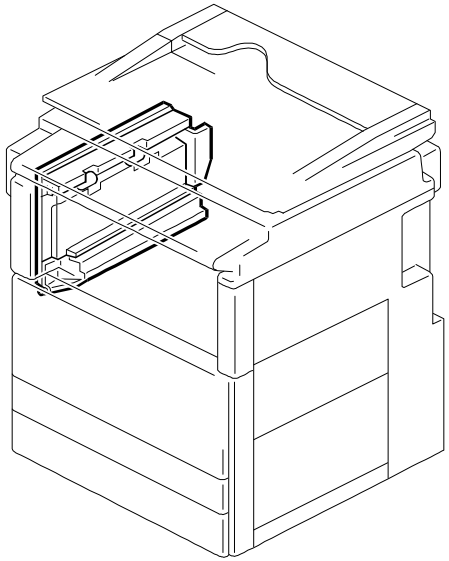
See Page 34

16. Transport Section 1 (A193)



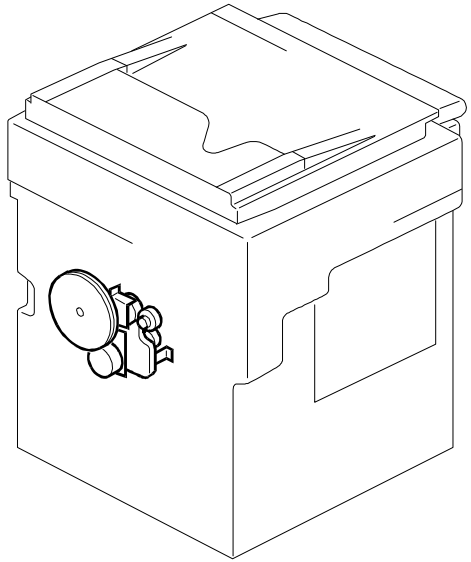
See Page 36

17. Transport Section 2 (A193)



See Page 38

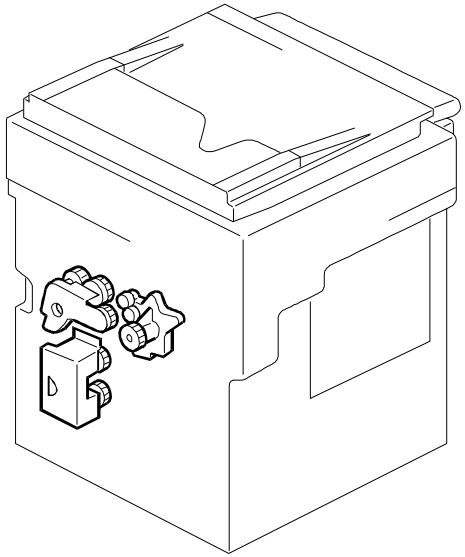
18. Drive Section 1 (A193)



See Page 40

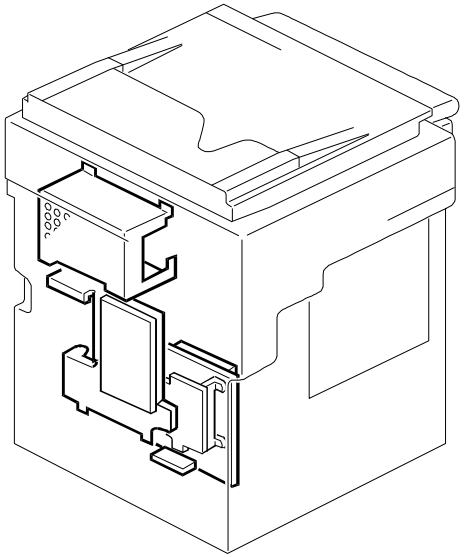
Location of unit

19. Drive Section 2 (A193)



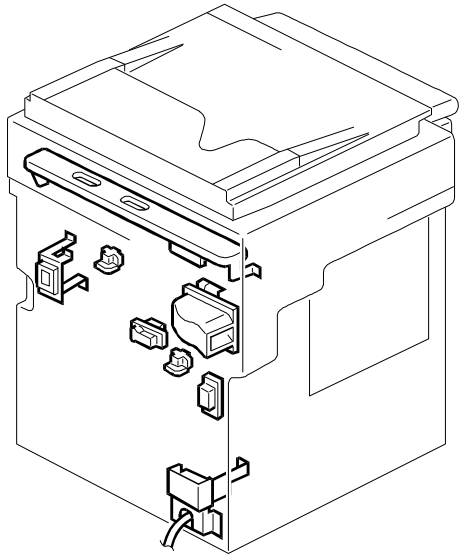
See Page 42

20. Electrical Section 1 (A193)



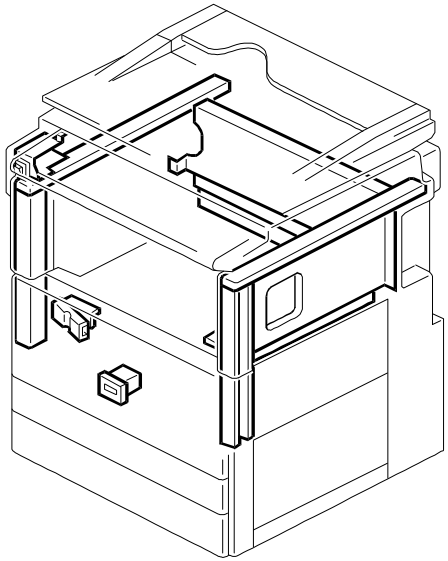
See Page 44

21. Electrical Section 2 (A193)



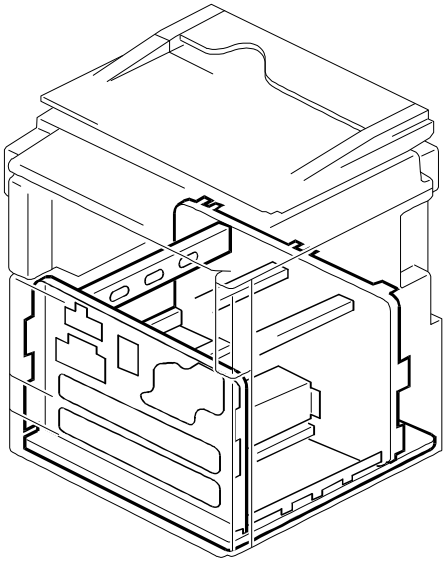
See Page 46

22. Frame Section 1 (A193)



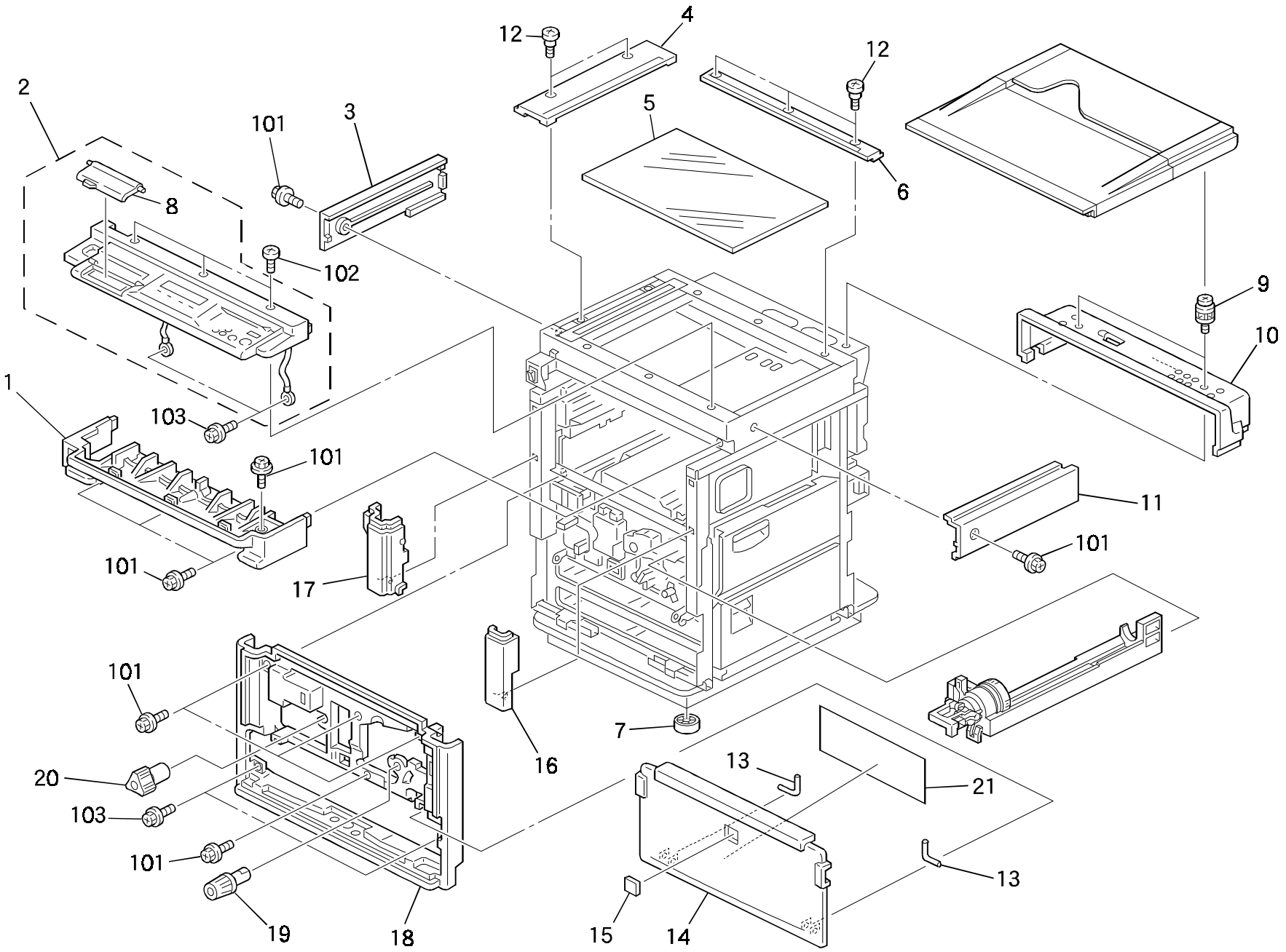
See Page 48

23. Frame Section 2 (A193)



See Page 50

1. Exterior 1 (A193)

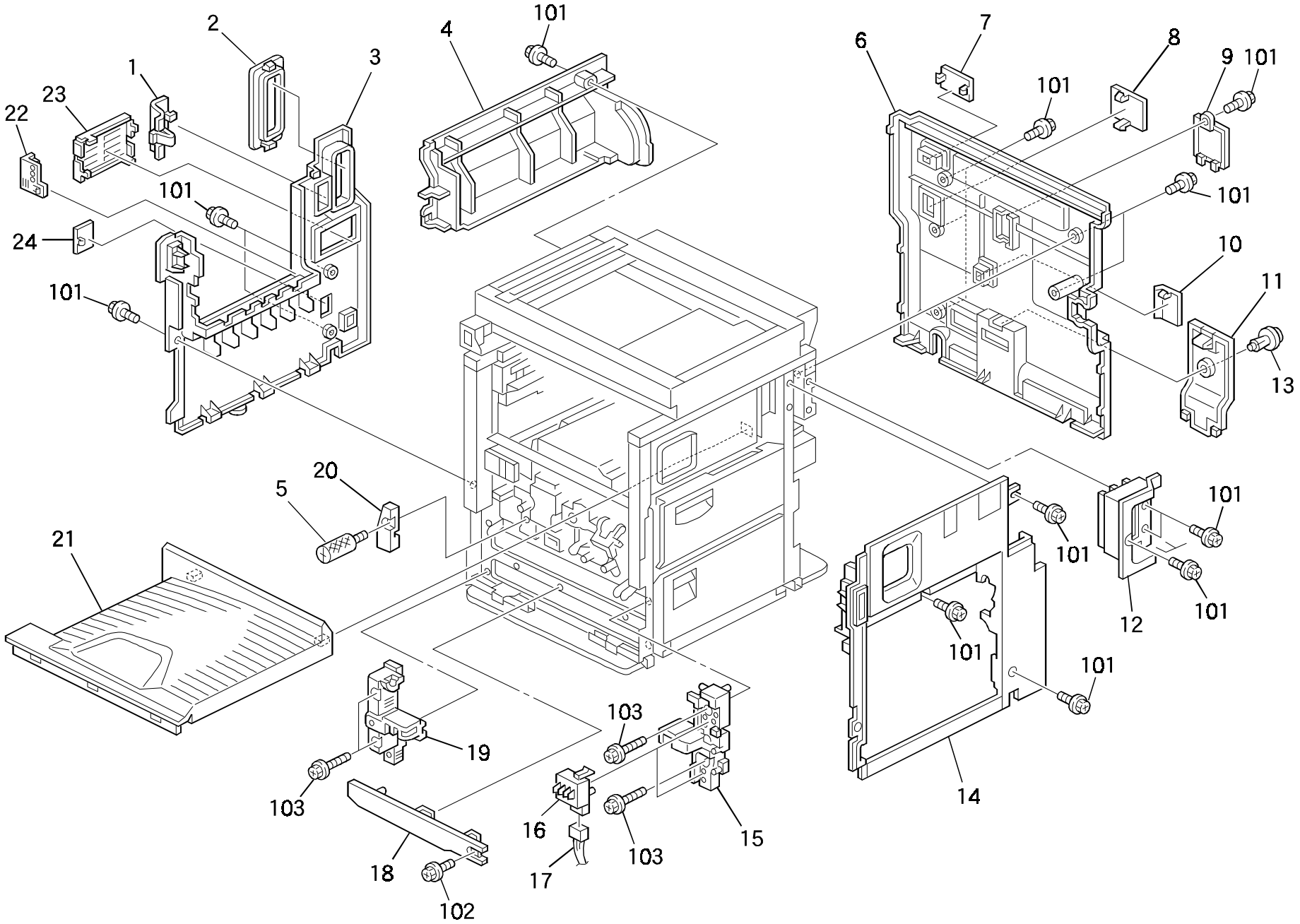


1. Exterior 1 (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	A193 1266	Lower Cover - Operation Panel	1
2	A193 1451	Operation Panel Ass'y (LT)	1
2	A193 1452	Operation Sub-unit (A4)	1
2	A193 1453	Operation Sub-unit (SVN)	1
3	A193 1251	Scanner Left Cover	1
4	A193 1680	Left Original Scale	1
5	5215 1980	Exposure Glass - A3T-3.2	1
6	A193 1757	Rear Original Scale	1
7	G020 1052	Stand	4
8	A193 1474	Lower Cover - Operation Panel	1
9	5215 1667	Platen Cover Stud	2
10	A193 1256	Upper Rear Cover	1
11	A193 1261	Scanner Right Cover	1
12	A193 1759	Stepped Screw	5
13	G020 1332	Hinge Front Door	2
14	A193 7226	Front Door (GES/LAN)	1
14	A193 7224	Front Door (SVN)	1
14	A193 7214	Front Door (INF)	1
14	A193 1501	Front Door (RIC)	1
15	A134 1380	Emblem (GES)	1
15	A133 7112	Emblem (SVN)	1
15	A134 1383	Emblem (RIC/LEN)	1
15	A153 6423	Support Cover (INF)	1
16	A193 1341	Right Front Cover	1
17	A193 1336	Left Front Cover	1
18	A193 1301	Front Cover	1
19	G020 2783	Registration Roller Knob	1
20	G020 4480	Fusing Knob	1
21	A193 1319	Operation Decal	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0802 5255	Tapping Screw - M3x8	
102	0353 0050F	Tapping Screw - M3x5	

2. Exterior 2 (A193)

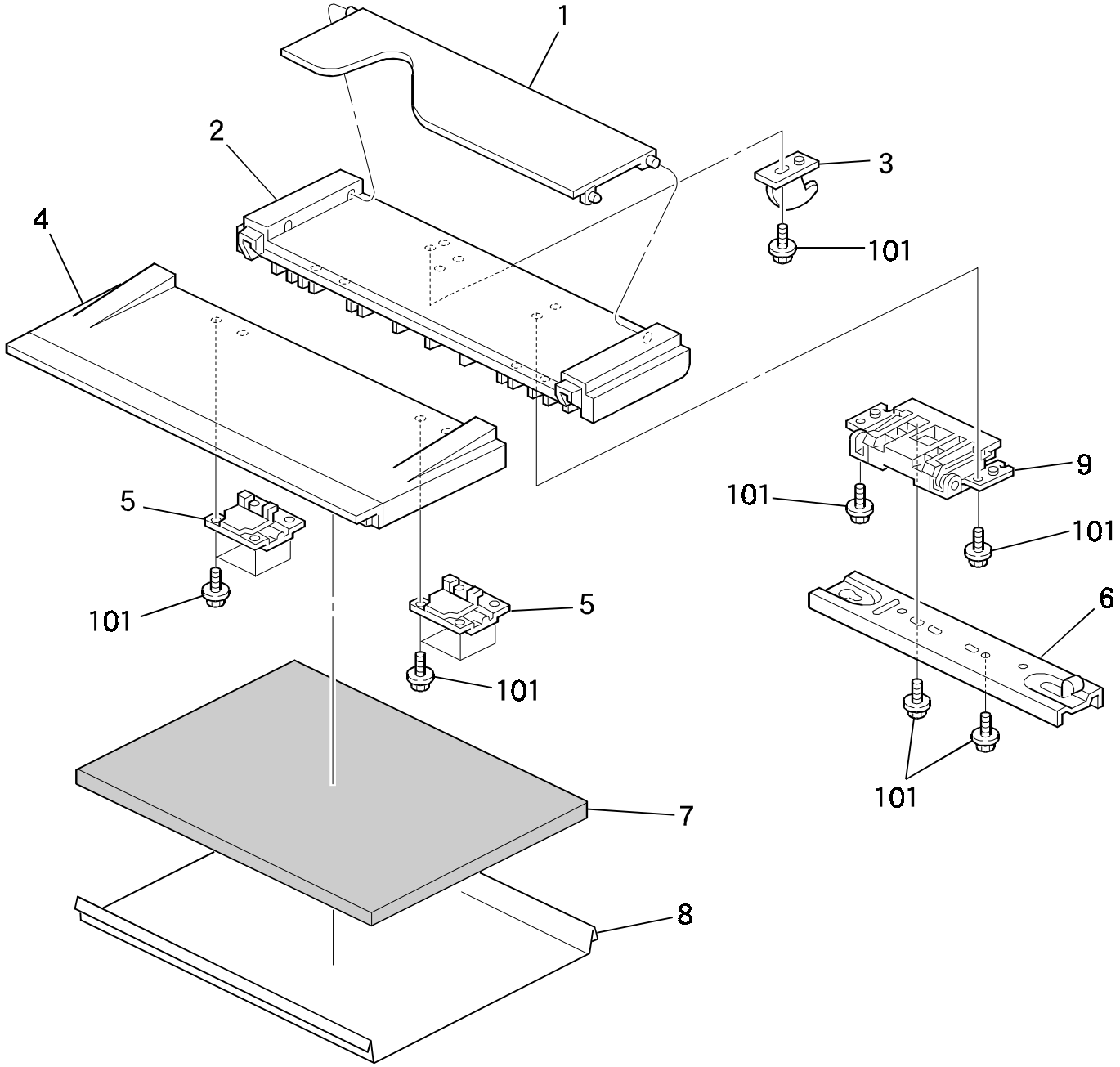


2. Exterior 2 (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	A193 1358	Cap - RS232C	1
2	A193 1356	Cap - IC Card	1
3	A193 1207	Lower Left Cover	1
4	A193 1276	Middle Left Cover	1
5	G020 1327	Knob Screw - M3	1
6	A193 1210	Lower Rear Cover	1
7	A193 1348	Cap - G4	1
8	A193 1350	Cap - NCU	1
9	A193 1354	Cap - Memory	1
10	A193 1352	Cap - CSS	1
11	A193 1361	Cap - Paper Tray Unit	1
12	A193 1281	Rear Right Cover	1
13	A193 1345	Rivet - M20	1
14	A193 1291	Lower Right Cover	1
15	G020 2676	Support - Paper Tray - Right	1
16	G020 2620	Paper Size Detector	2
17	G020 5403	Harness - Paper Size Detector	1
18	G020 1316	Inner Cover - Paper Feed Tray	1
19	G020 2677	Support - Paper Tray - Left	1
20	G020 1326	Cap - Inverter Unit	1
21	A193 1316	Lower Exit Cover	1
22	A193 1349	Cap - Sorter	1
23	A193 1366	Fan Cover	1
24	G020 1351	Cap - Finisher	1
25	G020 1327	Knob Screw - M3	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0802 5255	Tapping Screw - M3x8	
102	0802 5256	Tapping Screw - M3x8	
103	0451 3014B	Tapping Screw - M3x14	

3. Platen Cover (A645)

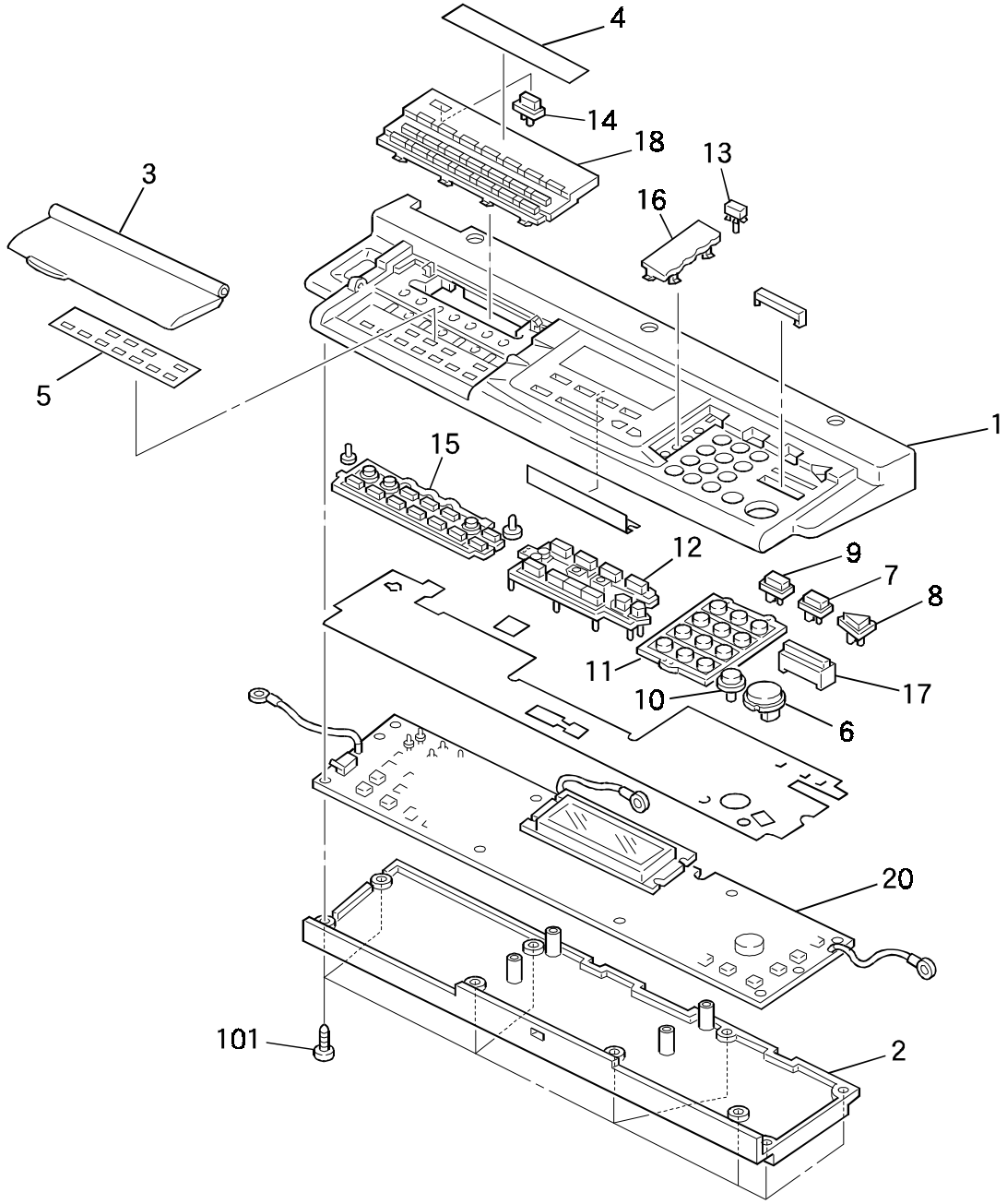


3. Platen Cover (A645)

Index No.	Part No.	Description	Q'ty Per Assembly
1	A193 1396	Original Holder	1
2	A193 1391	Rear Platen Cover	1
3	A193 1381	Platen Cover Actuator	1
4	A193 1386	Front Platen Cover	1
5	A193 1317	Platen Cover Bracket	2
6	A053 1957	Flex Hinge - Platen Cover	1
7	AA16 2067	Platen Cover Pad	1
8	5448 2804	Platen Cover Sheet	1
9	A193 1246	Platen Cover Hinge Ass'y	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0450 4012D	Tapping Screw - M4x12	

4. Operation Panel (A193)

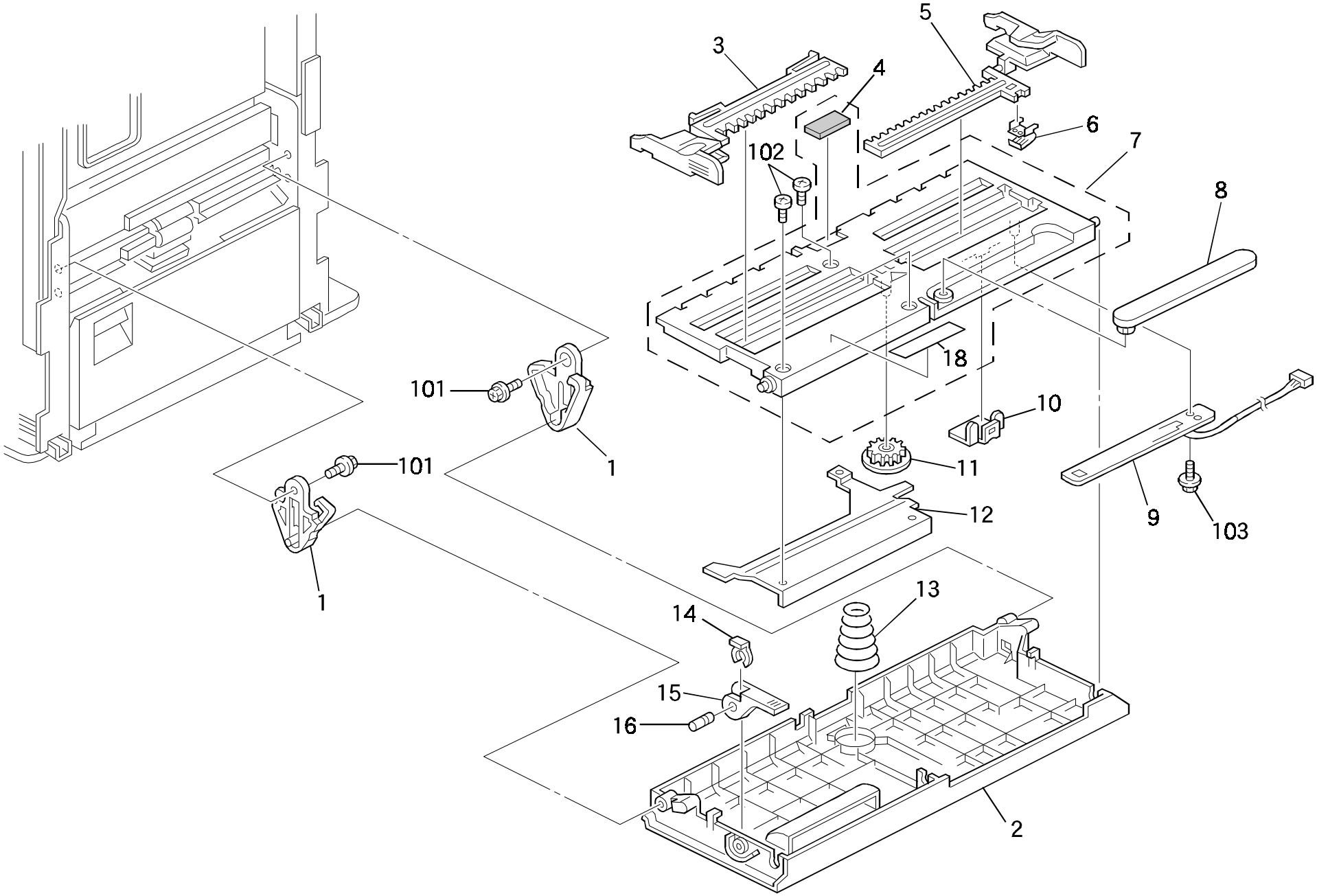


4. Operation Panel (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
*	A193 1451	Operation Panel Ass'y (LT)	1
*	A193 1452	Operation Panel Ass'y (A4)	1
1	A193 1455	Operation Panel Case (LT)	1
1	A193 1465	Operation Panel Case (A4)	1
2	A193 1472	Lower Case - Operation Panel	1
3	A193 1474	Lower Cover - Operation Panel	1
4	A193 1456	Decal - Operation Panel (LT)	1
4	A193 1466	Decal - Operation Panel (A4)	1
5	A193 1457	Sheet - Operation Panel (LT)	1
5	A193 1467	Sheet - Operation Panel (A4)	1
6	A193 1477	Key Top - Start	1
7	A193 1478	Key Top - Clear Mode	1
8	A193 1479	Key Top - Interrupt	1
9	A193 1480	Key Top - Program Mode	1
10	A193 1481	Key Top - Clear	1
11	A193 1461	Key Top - 10 Key (LT)	1
11	A193 1482	Key Top - 10 Key (A4)	1
12	A193 1483	Key Top - LCD	1
13	A193 1458	Key Top - Memory (LT)	1
13	A193 1468	Key Top - Memory (A4)	1
14	A193 1485	Key Top - Initial	1
15	A193 1486	Key Top - Behind	1
16	A193 1487	Right Cover - Operation Panel	1
17	A193 1488	Cover - Apprication	1
18	A193 1473	Upper Cover - Operation Panel	1
19	A193 1460	LCD (LT)	1
19	A193 1469	LCD (A4)	1
20	A193 1459	Operation Board (LT)	1
20	A193 1462	Operation Panel Board (A4)	1
21	A193 1483	Key Top - LCD	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0353 0050F	Tapping Screw - M3x5	

5. By-pass Feed Table (A193)

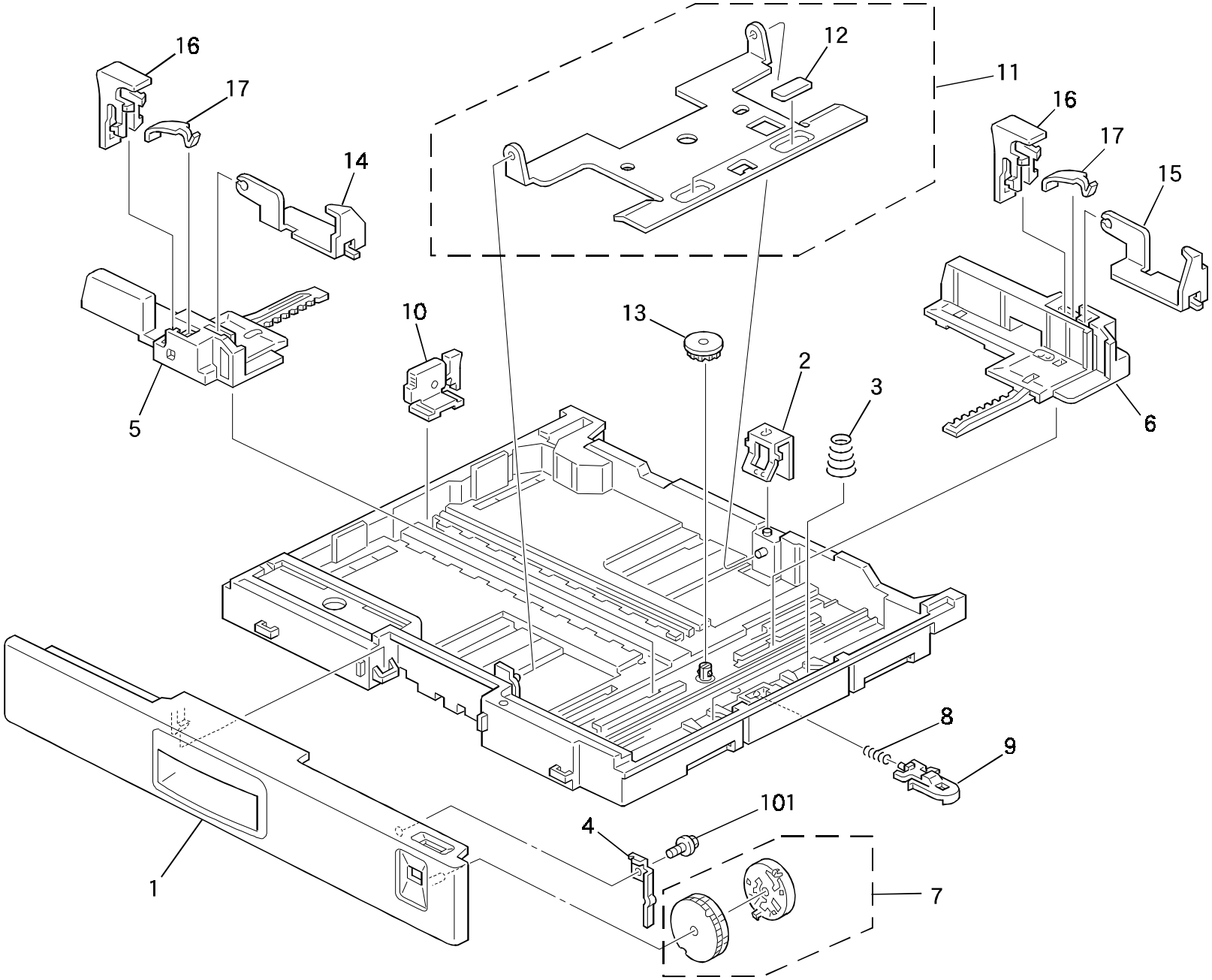


5. By-pass Feed Table (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	G020 2735	Guide - By-pass Feed Table	2
2	G020 2701	Cover - By-pass Table	1
3	G020 2706	Left Side Fence - By-pass Feed	1
4	5215 2713	Bottom Plate Pad	1
5	G020 2705	Right Side Fence - By-pass Feed	1
6	G020 2707	Sensor Conductor - By-pass Feed	1
7	G020 2709	Bottom Plate - By-pass Table	1
8	A190 2702	Paper Guide	1
9	G020 5280	By-pass Feed Sensor	1
10	G020 2708	Spring Plate - By-pass Feed	1
11	G011 3305	Gear - 16T	1
12	G020 2782	Stay - By-pass Table	1
13	G020 2702	Pressure Spring - By-pass Feed Table	1
14	5447 2681	Snap Ring	1
15	G020 2784	Lever - By-pass Feed Table	1
16	G020 2786	Shaft - By-pass Release Lever	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0451 3006B	Tapping Screw - M3x6	

6. Paper Tray (A193)

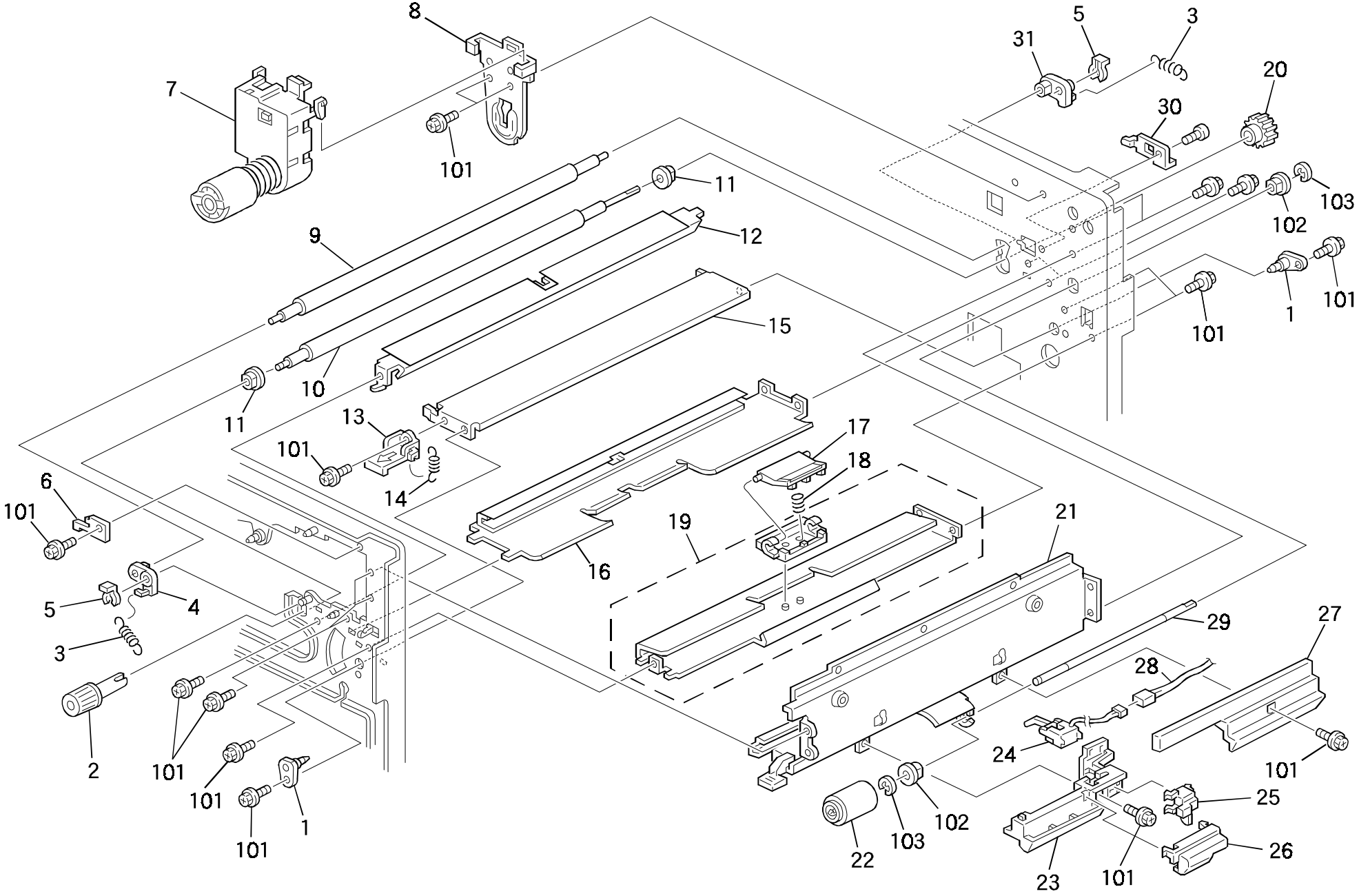


6. Paper Tray (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	G020 2647	Paper Tray Cover	1
2	G020 2658	Grounding Plate - Bottom Plate	1
3	G020 2656	Pressure Spring - Bottom Plate	1
4	G020 2648	Holder - Paper Size Detector	1
5	G020 2560	Front Side Fence	1
6	G020 2567	Rear Side Fence	1
7	A193 2649	Paper Size Detector (LT)	1
7	A193 2650	Paper Size Detector (A4)	1
8	G020 2599	Spring - Release Lever	1
9	G020 2592	Release Lever - Bottom Plate	1
10	G020 2644	End Fence	1
11	G020 2661	Bottom Plate Ass'y	1
12	G020 2645	Friction Pad	2
13	AB01 3868	Gear - 16Z	1
14	G020 2561	Front Paper Separator	1
15	G020 2568	Rear Paper Separator	1
16	G020 2664	Front Stopper Lever	2
17	A157 2769	Rear Stopper Spring	2

Index No.	Part No.	Description	Q'ty Per Assembly

7. Resistration (A193)

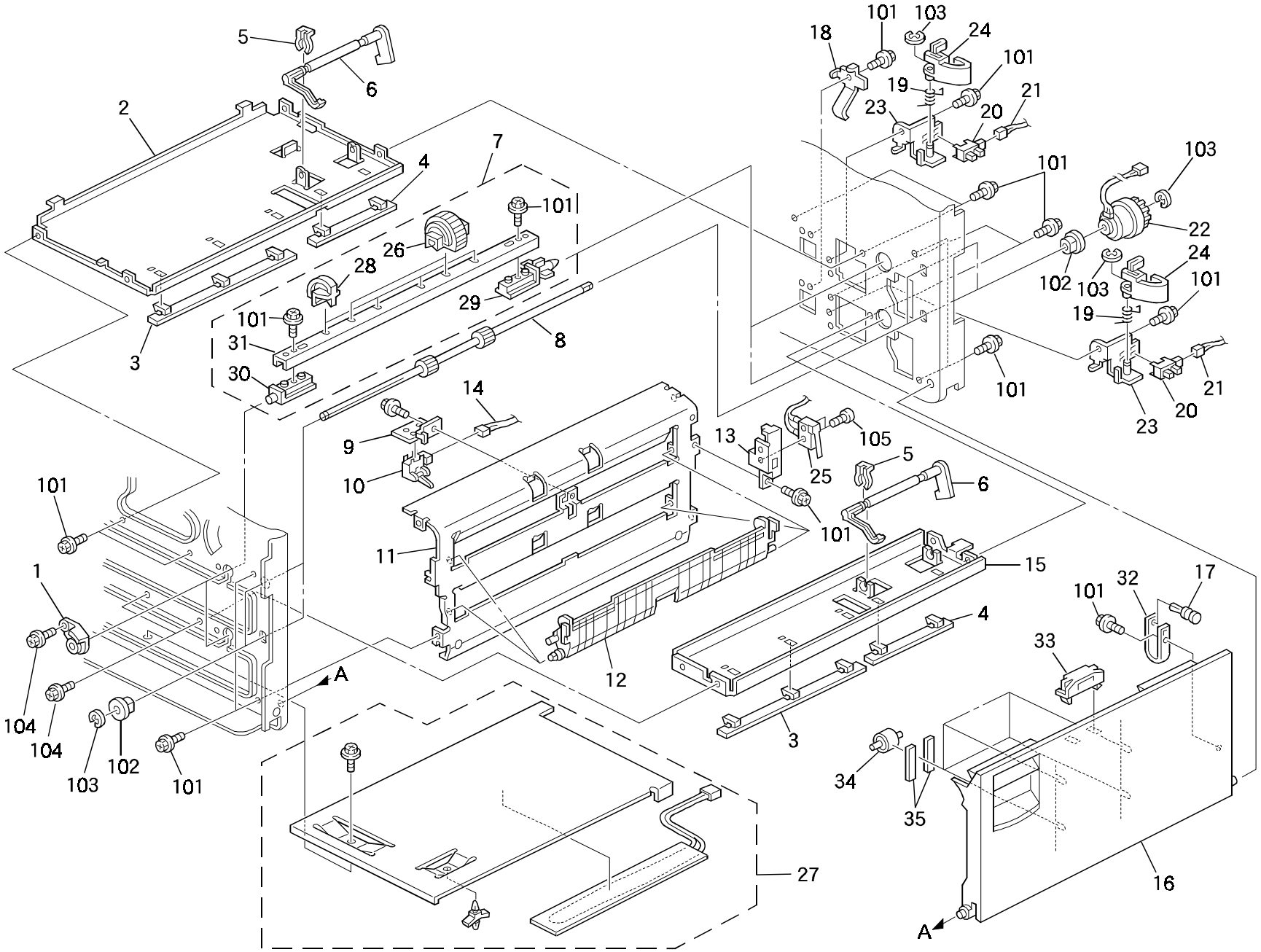


7. Resistration (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	G020 3888	Pin - Transfer Guide	2
2	G020 2783	Registration Roller Knob	1
3	G020 2743	Tension Spring	2
4	G020 2780	Front Bushing - Registration	1
5	5447 2681	Snap Ring	2
6	G020 3365	Cover Guide - Toner Bottle (LT)	1
6	A193 3367	Cover Guide - Toner Bottle (A4)	1
6	A193 3371	Cover Guide - Toner Bottle (OEM)	1
7	G020 1111	Motor - DC 2.16W	1
8	G020 1161	Bracket - Toner Supply Motor	1
9	G020 2742	Upper Registration Roller	1
10	G020 2740	Lower Registration Roller	1
11	AA08 2070	Bushing - 8x16x7	2
12	G020 2745	Lower Guide Plate - Regist	1
13	G020 2765	Knob - Lower Transport Guide	1
14	AA06 0331	Release Spring	1
15	G020 2761	Lower Transport Guide	1
16	G020 2754	Upper Paper Guide	1
17	G020 2714	Friction Pad - By-pass Feed	1
18	G020 2713	Pressure Spring	1
19	G020 2719	Stay - By-pass Feed	1
20	G020 2744	Gear - 16Z	1
21	G020 3361	Guide Plate - Toner Supply	1
22	G020 2721	By-pass Feed Roller	1
23	G020 2753	Bracket - Registration Sensor	1
24	G020 2771	Registration Sensor	1
25	G020 2772	By-pass Paper End Sensor	1
26	G020 2787	Cover - By-pass Paper End Sensor	1
27	G020 2785	Cover - Feed Roller Shaft	1
28	G020 5417	Harness - Registration Sensor	1
29	G020 2723	By-pass Feed Shaft	1
30	A193 1090	Bracket - PCU	1
31	G020 2781	Rear Bushing - Registration Roller	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0451 3006B	Tapping Screw - M3x6	
102	0805 3385	Bushing - 6 mm	
103	0720 0040E	Retaining Ring - M4	

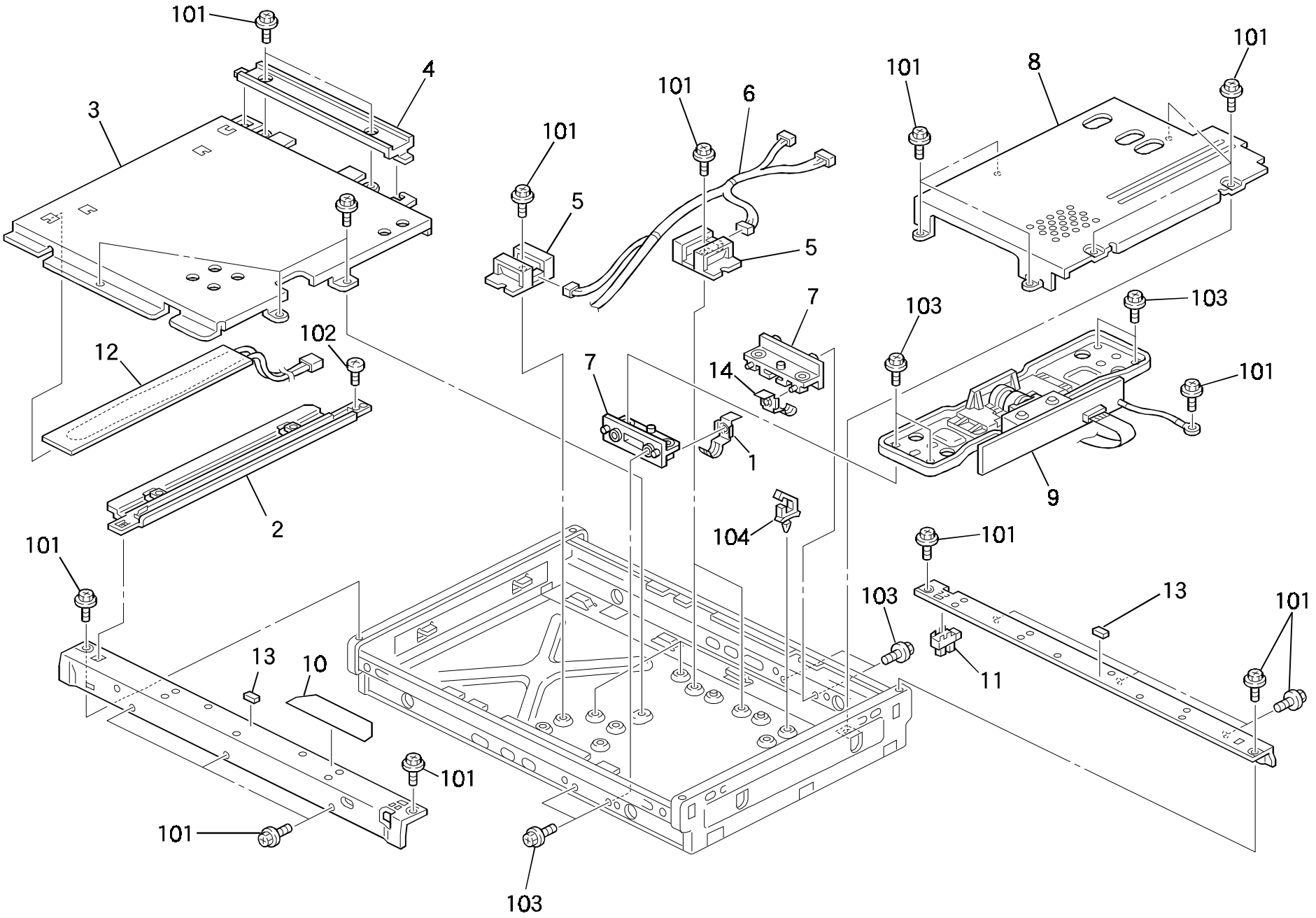
8. Paper Feed Section (A193)



8. Paper Feed Section (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	G020 2587	Bushing - Paper Feed	2
2	G020 1096	Right Shielding Plate	1
3	G020 2655	Upper Front Guide - Paper Tray	2
4	G020 2654	Upper Rear Guide - Paper Tray	2
5	5447 2681	Snap Ring	2
6	G020 2581	Paper End Feeler	2
7	G020 2554	Paper Feed Roller Ass'y	2
8	G020 2564	Relay Roller	1
9	G020 2589	Bracket - Vertical Transport Sensor	1
10	G020 2584	Photointerruptor	1
11	G020 2610	Left Vertical Transport Guide	1
12	G020 2613	Virtical Relay Guide	2
13	G020 2616	Bracket - Microswitch	1
14	G020 5408	Harness - Transport Sensor	1
15	G020 2618	Stay - Paper End Sensor	1
16	G020 2575	Guide Plate - Vertical Transport	1
17	A048 2838	Nylon Rivet	1
18	G020 2643	Front Grounding Plate - Paper Tray	2
19	G020 2626	Release Spring - Paper End Feeler	2
20	AW02 0075	Photointerrupter	2
21	G020 5409	Harness - Paper End Sensor	1
22	G020 1113	Relay Roller Clutch	2
23	G020 2580	Paper End Sensor Bracket	2
24	G020 2622	Release Arm - Paper End Feeler	2
25	G020 2615	Microswitch	1
26	**G020 2555**	**Paper Feed Roller**	**4**
27	A193 9800	Tray Heater - 115V	1
27	A193 9801	Tray Heater - 230V	1
28	G020 2565	Paper Guide	8
29	G020 2586	Rear Shaft - Paper Feed Roller	2
30	G020 2585	Front Shaft - Paper Feed Roller	2
31	G020 2570	Shaft - Paper Feed Roller	2
32	G020 2625	Holder - Vertical Transport Guide	1
33	G020 2630	Magnetic Catch	1
34	AF02 0283	Pressure Roller	4
35	G020 2577	Spring Plate - Driven Roller	8
101	0451 3006B	Tapping Screw - M3x6	
102	0805 3480	Bushing - 6 mm	
103	0720 0040E	Retaining Ring - M4	
104	0451 3008B	Tapping Screw - M3x8	
105	0242 0080B	Philips Pan Head Screw - M2X8	

9. Optics Section 1(A193)

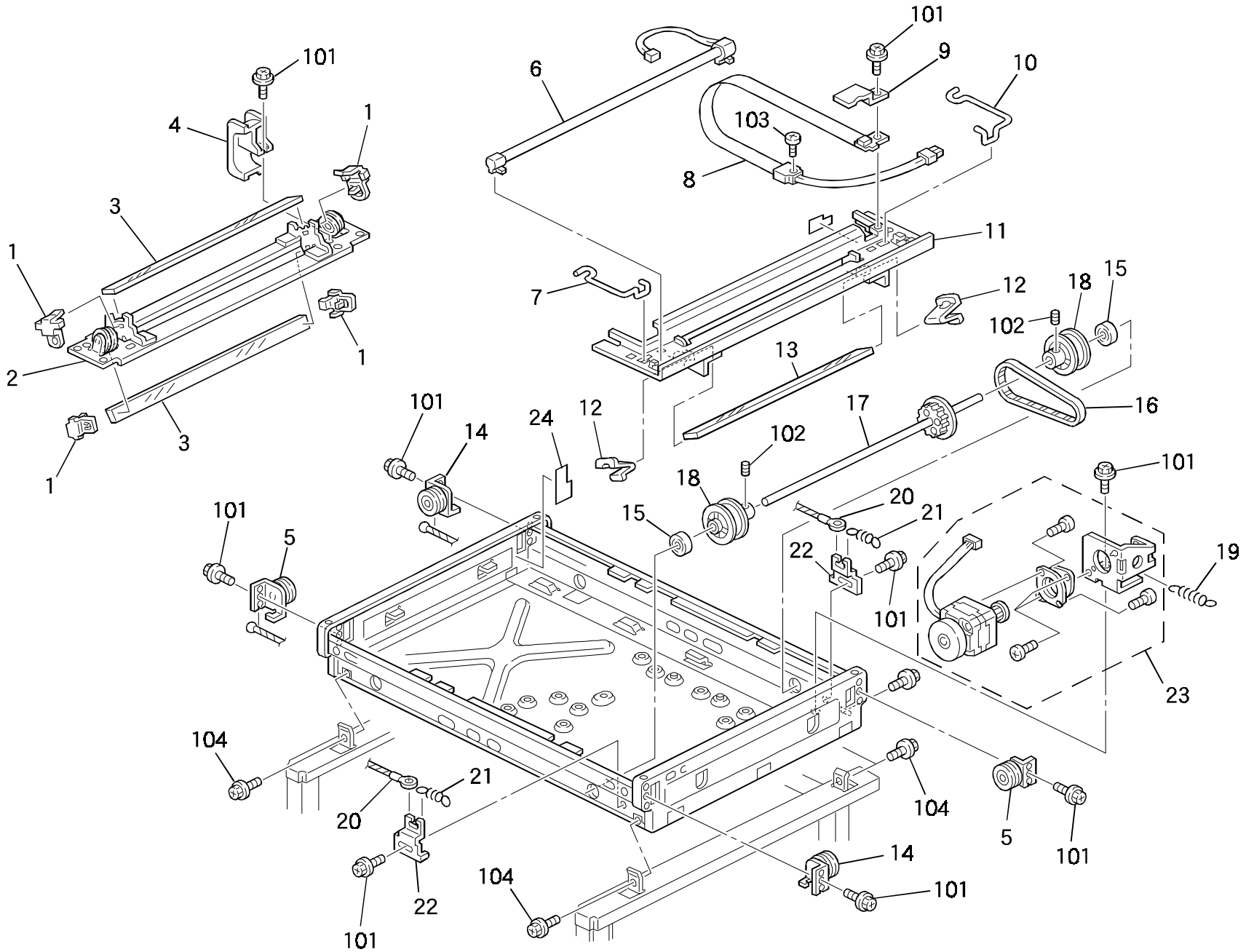


9. Optics Section 1(A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	A193 1790	Grounding Plate - Lens Block	1
2	A193 1754	Bracket - Left Origial Scale	1
3	A193 1824	Left Inner Cover - Scanner Unit	1
4	A193 1781	Lower Harness Guide	1
5	A193 5906	Original Sensor	3
6	A193 5414	Harness - Scanner Unit	1
7	A193 1826	Lens Block Holder	2
8	A193 1689	Right Inner Cover - Scanner Unit	1
9	A193 1673	Lens Holder Ass'y	1
10	A193 1819	Front Seal - Scanner Frame	1
11	AW02 0075	Photointerrupter	1
12	AX40 0089	Anticondensation Heater - 230V	1
12	AX40 0088	Anticondensation Heater - 115V	1
13	5442 1924	Exposure Glass Cushion	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0451 3006B	Tapping Screw - M3x6	
102	0353 0050F	Tapping Screw - M3x5	
103	0450 3010B	Tapping Screw - M3x10	
104	1105 0460	Clamp	

10. Optics Section 2 (A193)

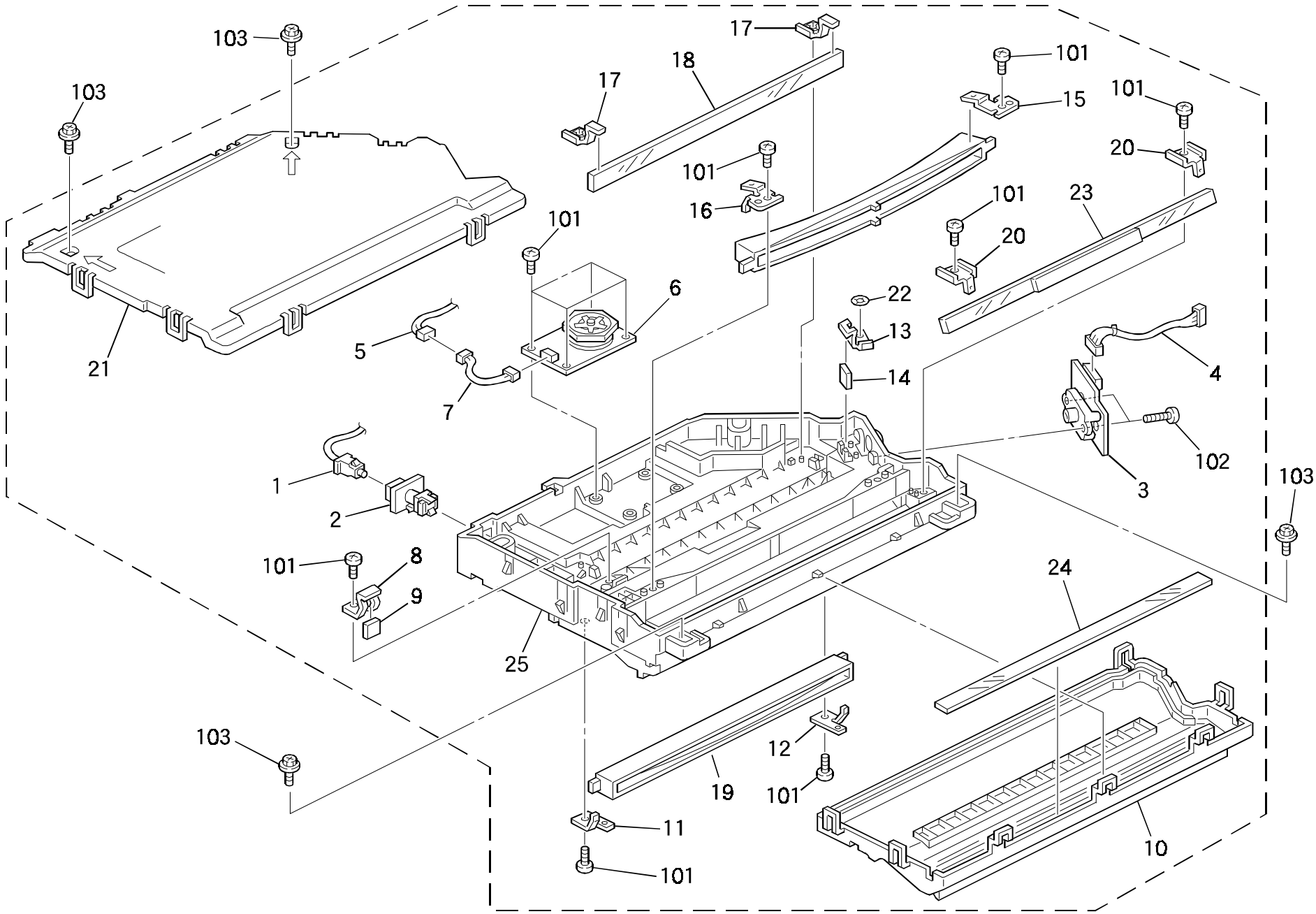


10. Optics Section 2 (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	A193 1777	2nd/3rd Mirror Holder	4
2	A193 1770	2nd Scanner Ass'y	1
3	A193 1669	2nd/3rd Mirror	2
4	A193 1776	Upper Harness Guide	1
5	A193 1841	Pulley - Front Left	2
6	A193 5702	Exposure Lamp	1
7	A193 1766	Wire Clamp	1
8	A193 5703	Exposure Lamp Harness	1
9	A193 1799	Harness Guide - Exposure Lamp	1
10	A193 1769	Wire Clamp	1
11	A193 1760	1st Scanner Ass'y	1
12	A193 1767	1st Mirror Holder	2
13	A193 1764	1st Mirror	1
14	A193 1845	Pulley - Rear Left	2
15	A193 1829	Ball Bearing - M8	2
16	A193 1840	Timing Belt - L220 B8	1
17	A193 1682	Scanner Drive Pulley Ass'y	1
18	A193 1832	Front Scanner Pulley	2
19	A193 1784	Tension Spring	1
20	A193 1838	Scanner Drive Wire	2
21	A193 1783	Tension Spring	2
22	A193 1849	Tension Bracket	2
23	A193 1690	Scanner Motor - DC 5.64W	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0451 3006B	Tapping Screw - M3x6	
102	0575 0050E	Hexagon Headless Set Screw - M5x5	
103	0453 3014B	Tapping Screw - M3x14	
104	0451 3008B	Tapping Screw - M3x8	

11. Laser Unit (A193)

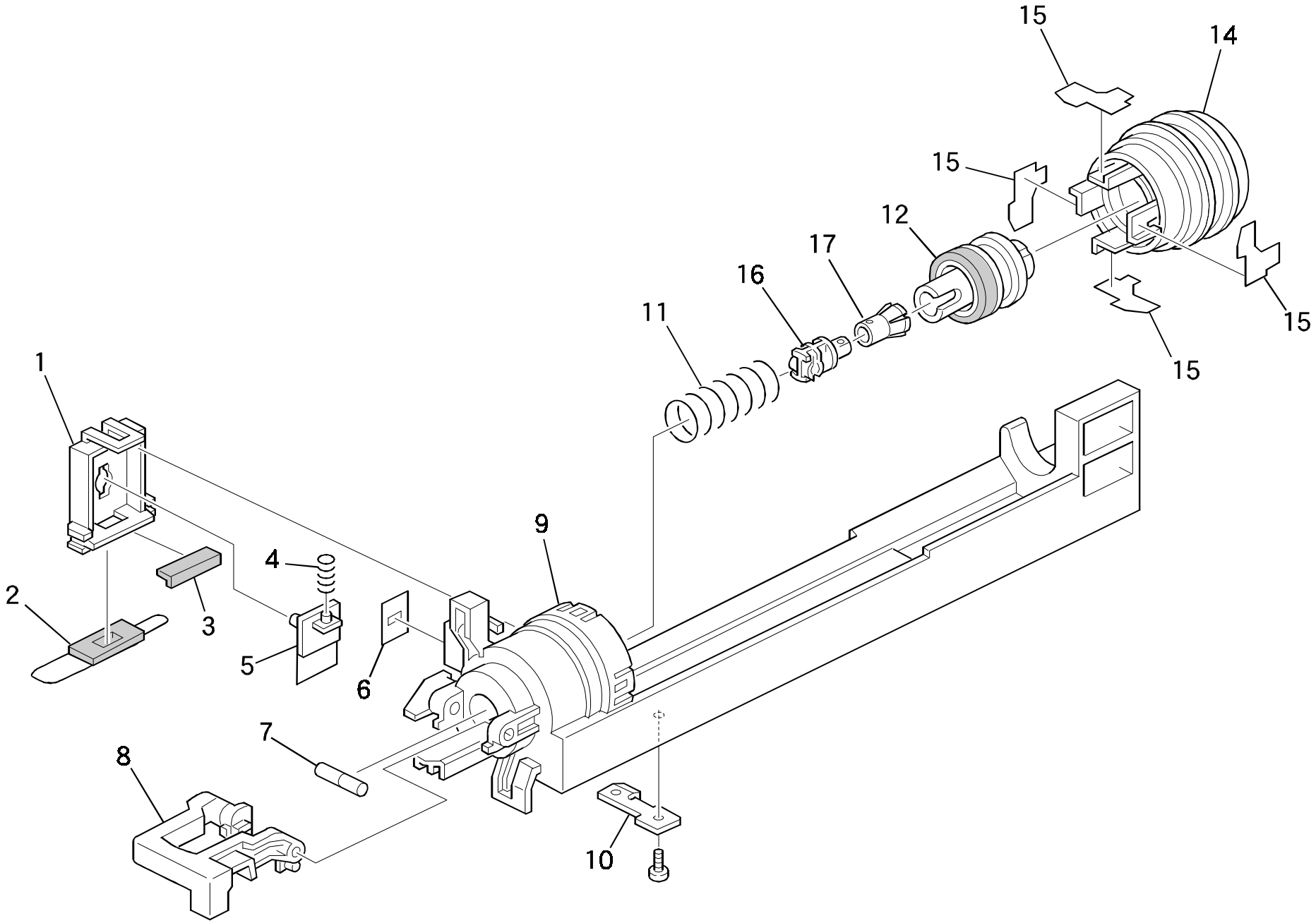


11. Laser Unit (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	A193 5742	LD Unit Harness (230V)	1
1	A193 5220	LD Unit Harness (115V)	1
2	G020 1912	Sync Detector	1
3	A193 1853	Laser Unit (115V)	1
3	A193 1855	Laser Unit (230V)	1
4	A193 1861	LD Unit Ass'y (115V)	1
4	A193 1865	LD Unit Ass'y (230V)	1
5	A193 5438	Relay Harness - Polygon Mirror Motor	1
6	G020 1961	Polygon Mirror Motor	1
7	G020 5439	Harness - Polygon Mirror Motor	1
8	G020 1915	Sync Detector Mirror Holder	1
9	G020 1911	Sync Detector Mirror	1
10	G020 1902	Lower Cover - Laser Unit	1
11	G020 1903	Right Holder - BTL Lens	2
12	G020 1904	Left Holder - BTL Lens	1
13	G020 1905	Cylindrical Lens Holder	1
14	G020 1966	Cylindrical Lens	1
15	G020 1906	Left Holder - F Theta Mirror	1
16	G020 1907	Right Holder - F Theta Mirror	1
17	G020 1908	1st Mirror Holder	2
18	G020 1964	1st Mirror - Laser Unit	1
19	G020 1969	BTL Lens	1
20	G020 1909	2nd Mirror Holder	2
21	G020 1910	Laser Unit Cover	1
22	G020 1923	CS Ring - M2.4	1
23	G020 1928	2nd Mirror - Laser Unit	1
24	G020 1962	Shield Glass	1
25	G020 1900	Laser Unit Case	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0452 3008B	Tapping Screw - M3x8	
102	0452 3010B	Tapping Bind Screw - M3x10	

12. Toner Hopper Unit (A193)

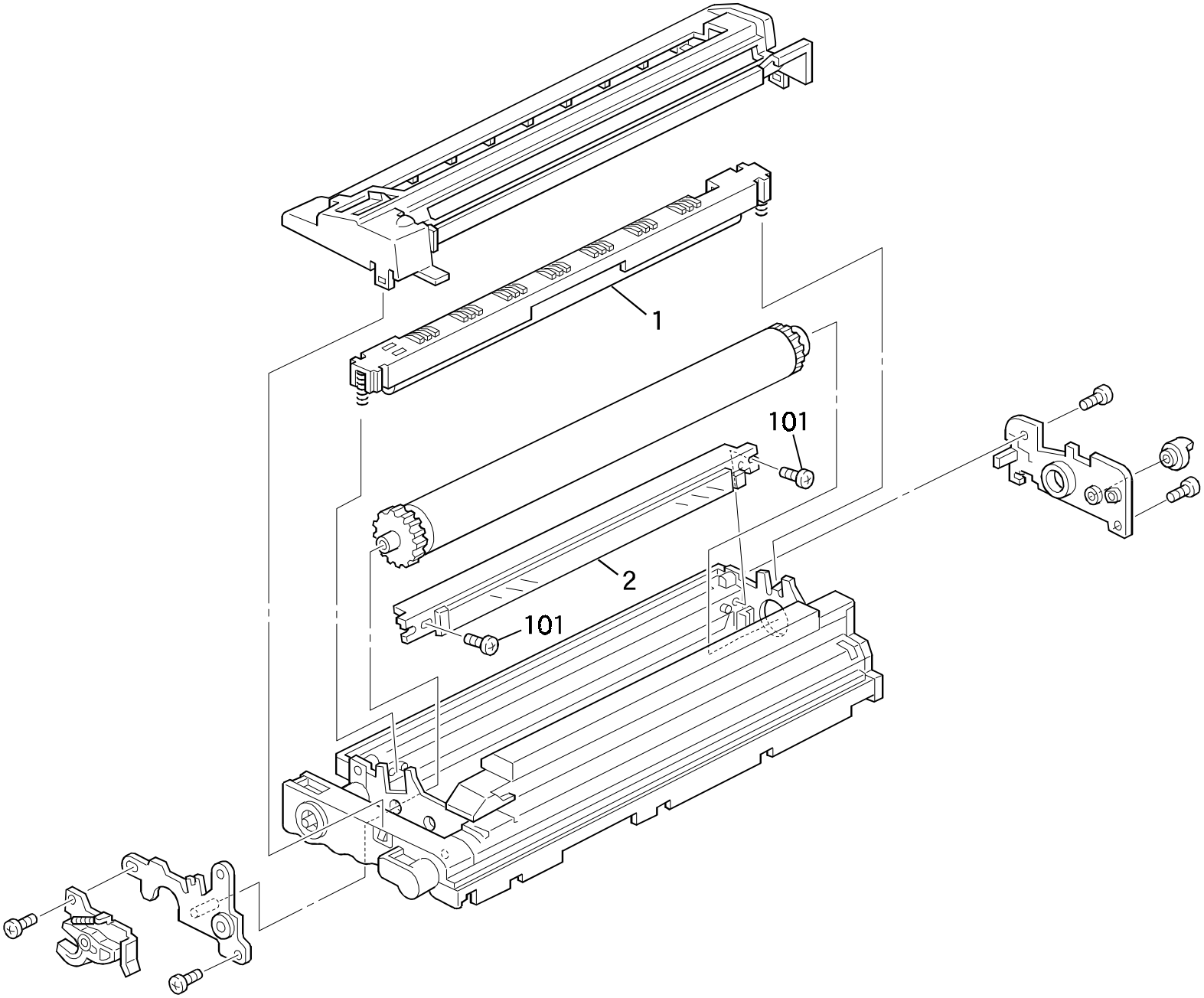


12. Toner Hopper Unit (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	G020 3311	Cover - Toner Supply	1
2	G020 3340	Lower Seal - Toner Supply	1
3	G020 3345	Right Seal - Toner Supply	1
4	G020 3313	Spring - Toner Supply Cover	1
5	G020 3317	Shutter - Toner Supply	1
6	G020 3312	Gate - Toner Supply	1
7	A184 3422	Toner Slider	1
8	G020 3339	Handle - Toner Supply	1
9	G020 3314	Toner Supply Unit	1
10	G020 3320	Hook - Toner Supply Unit	1
11	A184 3411	Chuck Spring	1
12	G020 3334	Slider - Toner Supply	1
14	G020 3322	Cover - Toner Supply Unit	1
15	G020 3325	Sheet - Agitator	4
16	A184 3421	Chuck Shaft	1
17	A184 3420	Bottle Chuch	1

Index No.	Part No.	Description	Q'ty Per Assembly

13. P.C.U. (A193)

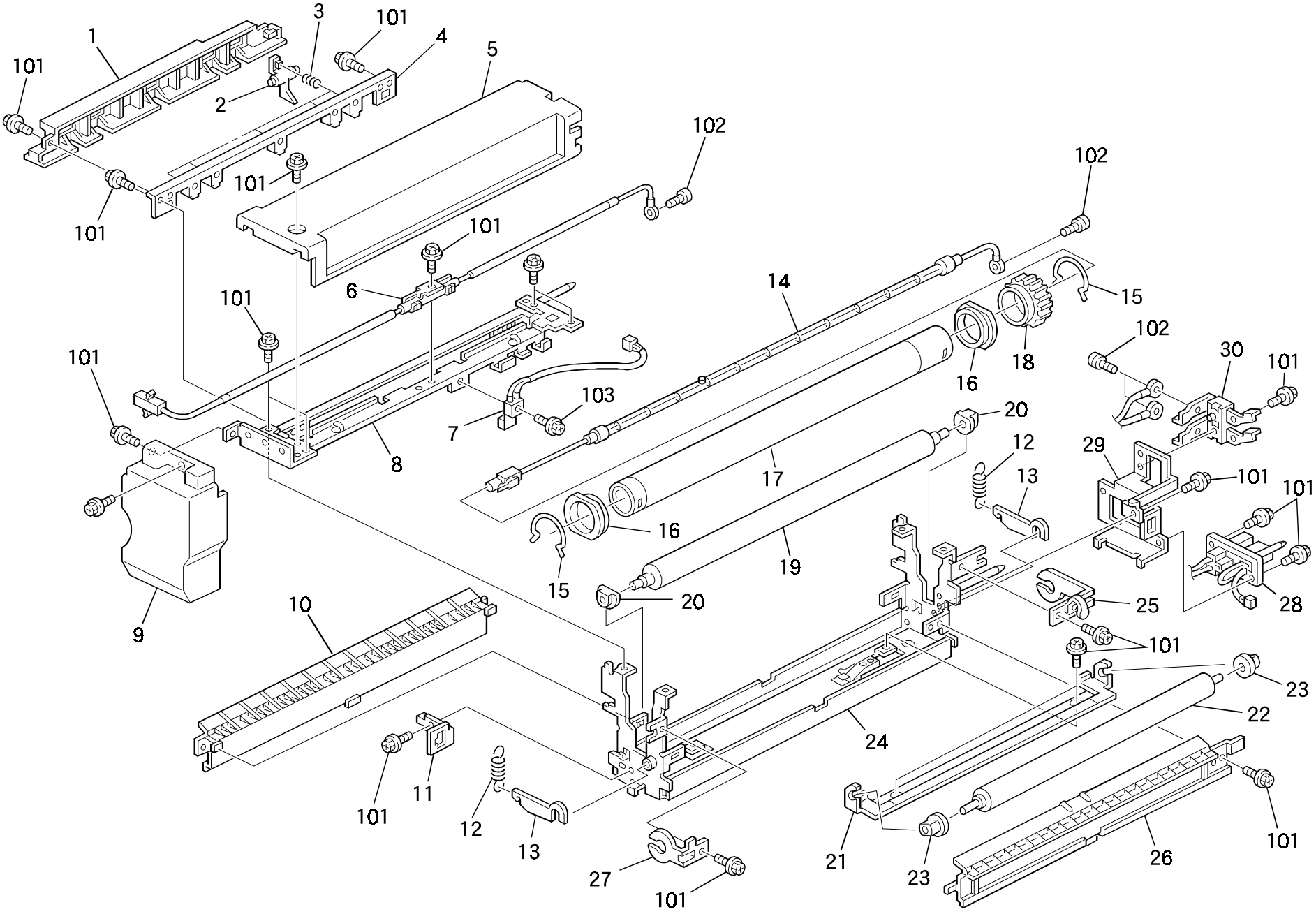


13. P.C.U. (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	G020 2020	Charge Roller Ass'y	1
2	G020 3550	Cleaning Blade	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0452 3008B	Tapping Screw - M3x8	

14. Fusing Unit (A193)

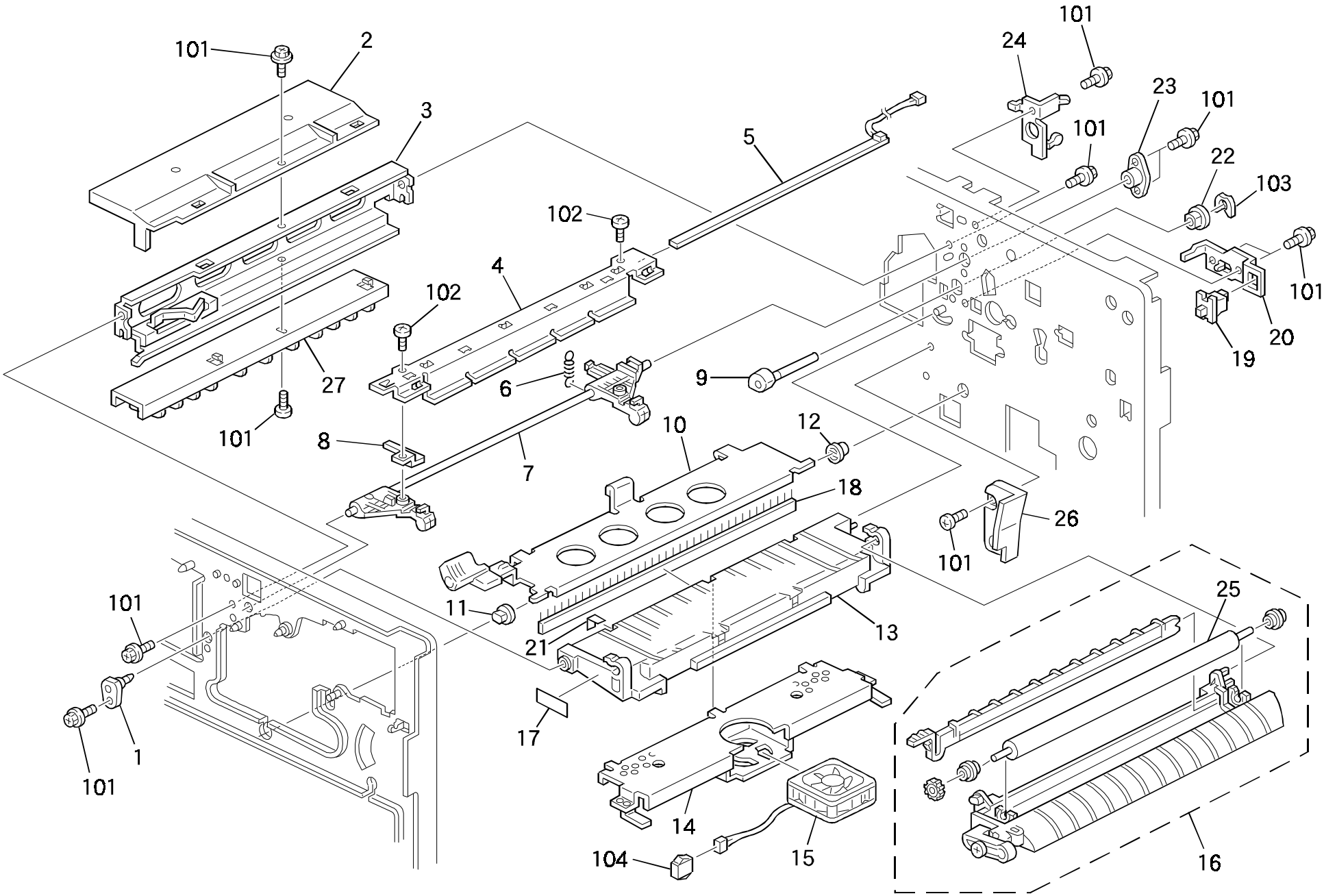


14. Fusing Unit (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
*	A193 4017	Fusing Unit (115V)	1
*	A193 4027	Fusing Unit (230V)	1
1	G020 4149	Upper Exit Guide - Fusing Unit	1
2	**G020 4178**	**Hot Roller Stripper**	**5**
3	G020 4193	Spring - Hot Roller Stripper	5
4	G020 4179	Bracket - Hot Roller Stripper	1
5	G020 4129	Upper Fusing Cover	1
6	G020 4133	Thermofuse - 169°C	1
7	G020 4185	Fusing Thermistor	1
8	G020 4130	Star - Fusing Unit	1
9	G020 4166	Front Fusing Cover	1
10	G020 4147	Lower Exit Guide - Fusing Unit	1
11	G020 4152	Connector Bracket - Fusing Unit	1
12	G020 4191	Pressure Spring	2
13	G020 4145	Pressure Lever - Fusing Unit	2
14	A193 4187	Fusing Lamp - 120V 800W	1
14	A193 4188	Header - 230V 700W	1
15	G020 4174	C-ring - Hot Roller	2
16	G020 4173	Bushing - 36 mm	2
17	**G020 4170**	**Hot Roller**	**1**
18	G020 4177	Gear - 40Z	1
19	**G020 4180**	**Pressure Roller**	**1**
20	G020 4175	Bushing - Pressure Roller	2
21	G020 4112	Bracket - Cleaning Roller	1
22	AE04 2009	Cleaning Roller	1
23	G020 4176	Bushing - Cleaning Roller	2
24	G020 4141	Fusing Unit Frame	1
25	G020 4159	Rear Holder - Fusing Lamp	1
26	G020 4146	Lower Entrance Guide	1
27	G020 4161	Front Holder Fusing Lamp	1
28	A193 4183	Fusing Unit Harness (115V)	1
28	A193 4184	Fusing Unit Harness (230V)	1
29	G020 4151	Bracket - Fusing Connector	1
30	G020 4163	Heater Socket	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0451 3006B	Tapping Screw - M3x6	
102	0950 4006M	Philips Screw With Flat Washer - M4x6	
103	0451 3010B	Tapping Screw - M3x10	

15. Paper Exit Section (A193)

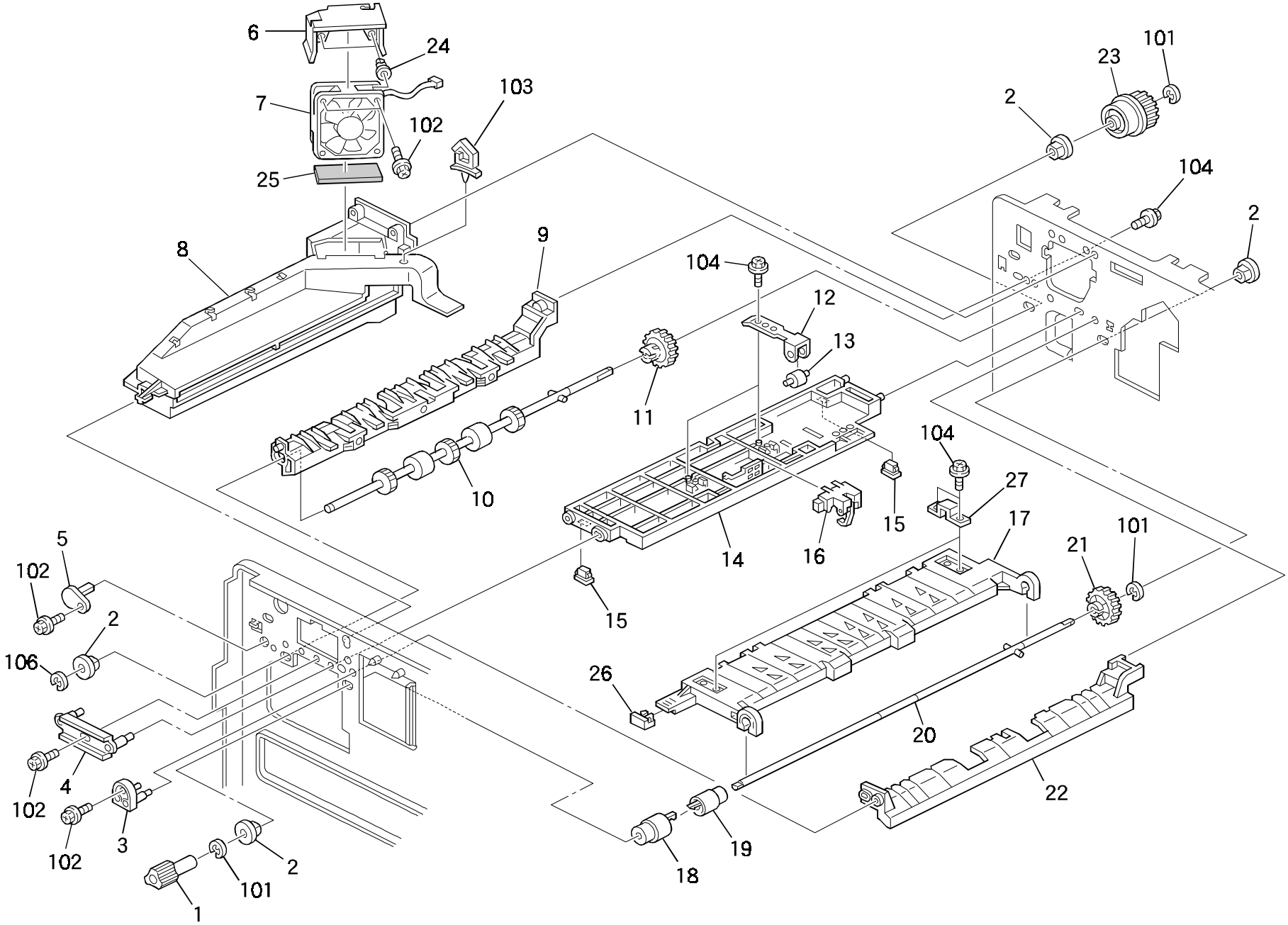


15. Paper Exit Section (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	G020 3888	Pin - Transfer Guide	1
2	G020 1106	Right Duct	1
3	G020 1098	Stay - OPU	1
4	G020 2105	Bracket - Quenching Lamp	1
5	G020 2104	Quenching Lamp	1
6	G020 2103	Tension Spring	1
7	G020 2107	Pressure Lever - Charge Roller	1
8	G020 2148	Grounding Plate - Quenching Lamp	1
9	G020 2121	CAM - Charge Roller	1
10	G020 3910	Stay - Transfer Unit	1
11	G020 3914	Bushing - Front Transfer Unit	1
12	G020 3915	Bushing - Rear Transfer Unit	1
13	G020 3880	Transport Guide Plate	1
14	G020 3882	Grounding Plate - Transfer Guide	1
15	G020 3887	Fan Motor - DC 3.12W	1
16	**A673 3881**	**Transfer And Separation Unit**	**1**
17	G020 4128	Decal - High Temparature	1
18	G020 3897	Discharge Brush - Transport	1
19	G020 5626	Push Switch	1
20	G020 5817	Bracket - OPU Switch	1
21	G020 3896	Grounding Plate - Discharge Brush	1
22	AA08 2070	Bushing - 8x16x7	1
23	G020 2106	Bushing - Pressure Lever	1
24	G020 1194	Bracket - Fusing Drive Gear	1
25	G020 3852	Transfer Roller	1
26	G020 3940	Guide - Transfer Roller Unit	1
27	G020 1088	Front Guide - Fusing Unit	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0451 3006B	Tapping Screw - M3x6	
102	0452 3008B	Tapping Screw - M3x8	
103	0805 0088	Retaining Ring - M6	
104	1102 6245	Connector - 2P	

16. Transport Section 1 (A193)

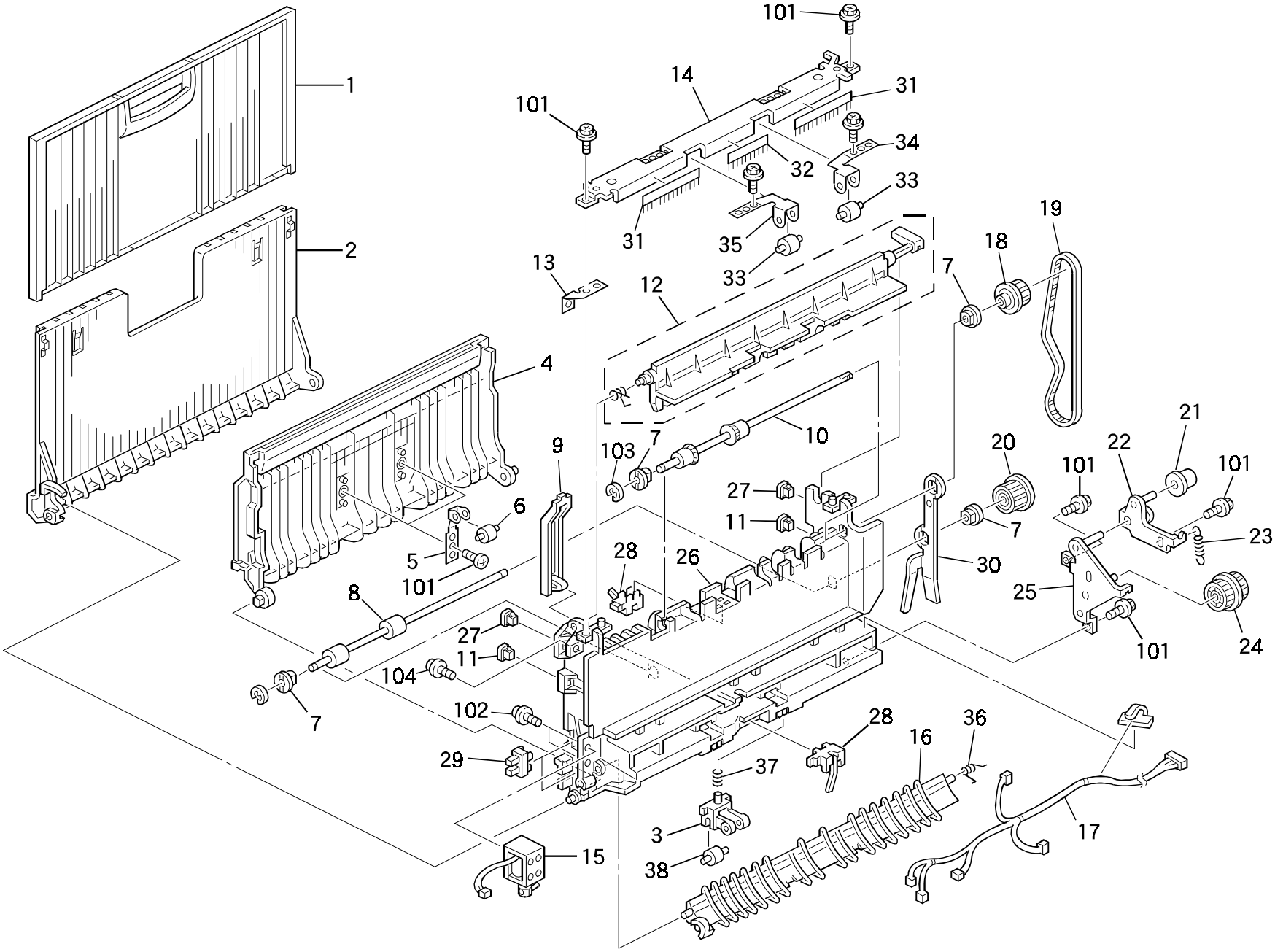


16. Transport Section 1 (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	G020 4480	Fusing Knob	1
2	G020 4479	Bushing - 6 mm	4
3	G020 4477	Support Bracket - Transport Plate	1
4	G020 4476	Guide Plate Holder	1
5	G020 4331	Front Stud - 1 Bin Sorter	1
6	G020 1104	Fan Motor Holder	1
7	AX64 0058	Fan Motor - DC 24V 4.32W	1
8	G020 1100	Duct	1
9	G020 4459	Relay Guide - Transport Roller	1
10	G020 4414	Transport Roller Ass'y	1
11	G020 4487	Gear - 26Z	1
12	G020 4491	Roller Holder	2
13	AF04 0031	Upper Exit Roller	2
14	G020 4473	Upper Transport Guide	1
15	G012 1531	Magnet	2
16	G020 4490	Paper Exit Sensor	1
17	G020 4412	Lower Transport Plate Ass'y	1
18	G020 4457	Transport Roller - 1	1
19	G020 4458	Transport Roller - 2	1
20	G020 4413	Shaft - Transport Roller	1
21	G020 4489	Gear - 24Z	1
22	G020 4475	Guide Plate - Transport	1
23	G020 4456	Pulley - 33Z	1
24	G020 1107	Nut - M4	1
25	G020 1105	Cushion - Fan Motor	1
26	G020 4492	Knob - Guide Plate	1
27	G020 4493	Magnet	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0720 0040E	Retaining Ring - M4	
102	0451 3006B	Tapping Screw - M3x6	
103	1105 0310	Wire Clamp	
104	0450 3008B	Tapping Screw - M3x8	

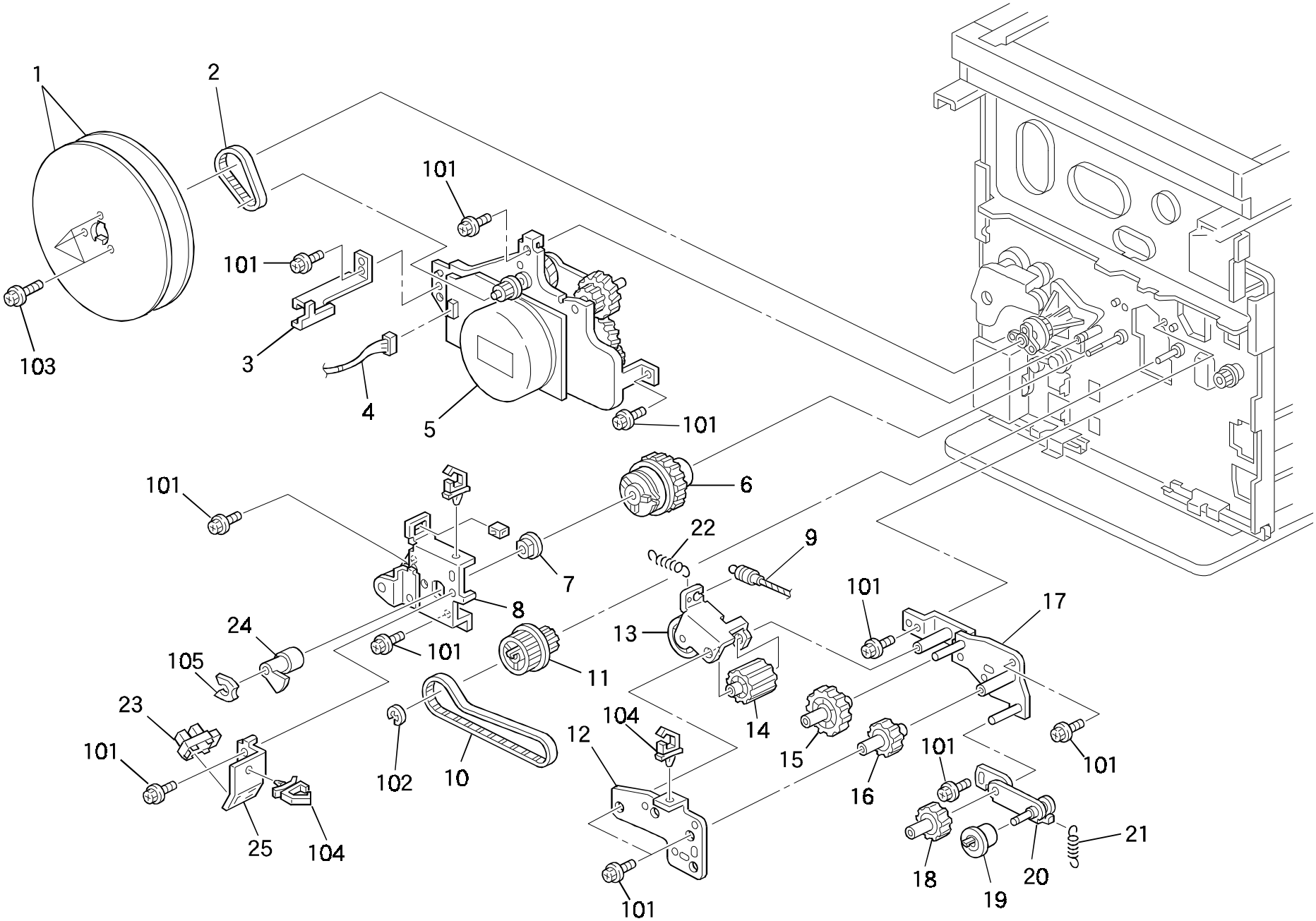
17. Transport Section 2 (A193)



17. Transport Section 2 (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	G020 4423	Sub Copy Tray - FU	1
2	G020 4419	Left Cover Tray	1
3	G020 4463	Roller Holder	2
4	G020 4452	Right Vertical Guide	1
5	G020 4446	Spring Plate - Roller	2
6	G012 4865	Exit Roller	2
7	G020 4466	Bushing - M6	4
8	G020 4426	Exit Relay Roller	1
9	G020 4465	Harness Cover	1
10	G020 4427	Exit Roller - FD	1
11	G012 1531	Magnet	2
12	G020 4411	Paper Exit Pawl	1
13	G020 4453	Grounding Plate	1
14	G020 4468	Stay - FD	1
15	G020 4439	Junction Gate Solenoide - FD	1
16	G020 4424	Junction Gate - FU	1
17	G020 5402	Harness - Paper Exit	1
18	G020 4436	Pulley - 28Z	1
19	G020 4437	Timing Belt - B60S2M-386	1
20	G020 4435	Pulley - 32Z	1
21	G020 4444	Tightener	1
22	G020 4333	Tightener - 1 Bin Sorter	1
23	G020 4440	Tension Spring	1
24	G020 4447	Pulley - 44Z	1
25	G020 4332	Rear Stud - 1 Bin Sorter	1
26	G020 4409	Guide Plate - Feed Down	1
27	A049 3371	Magnet	2
28	G020 4429	Exit Sensor	2
29	AW02 0075	Photointerrupter	1
30	G020 4481	Grounding Plate - Exit Roller	1
31	G020 4483	Antistatic Brush - FD	2
32	G020 4482	Middle Antistatic Brush - FD	1
33	G020 4390	Exit Roller	2
34	G020 4471	Rear Spring Plate - Driven Roller	1
35	G020 4470	Front Spring Plate - Driven Roller	1
36	G020 4467	Tension Spring	1
37	G020 4431	Pressure Spring	2
38	AF04 0031	Upper Exit Roller	2
101	0450 3008B	Tapping Screw - M3x8	
102	0957 3008B	Philips Screw	
103	0720 0040E	Retaining Ring - M4	
104	0451 3006B	Tapping Screw - M3x6	

18. Drive Section 1 (A193)

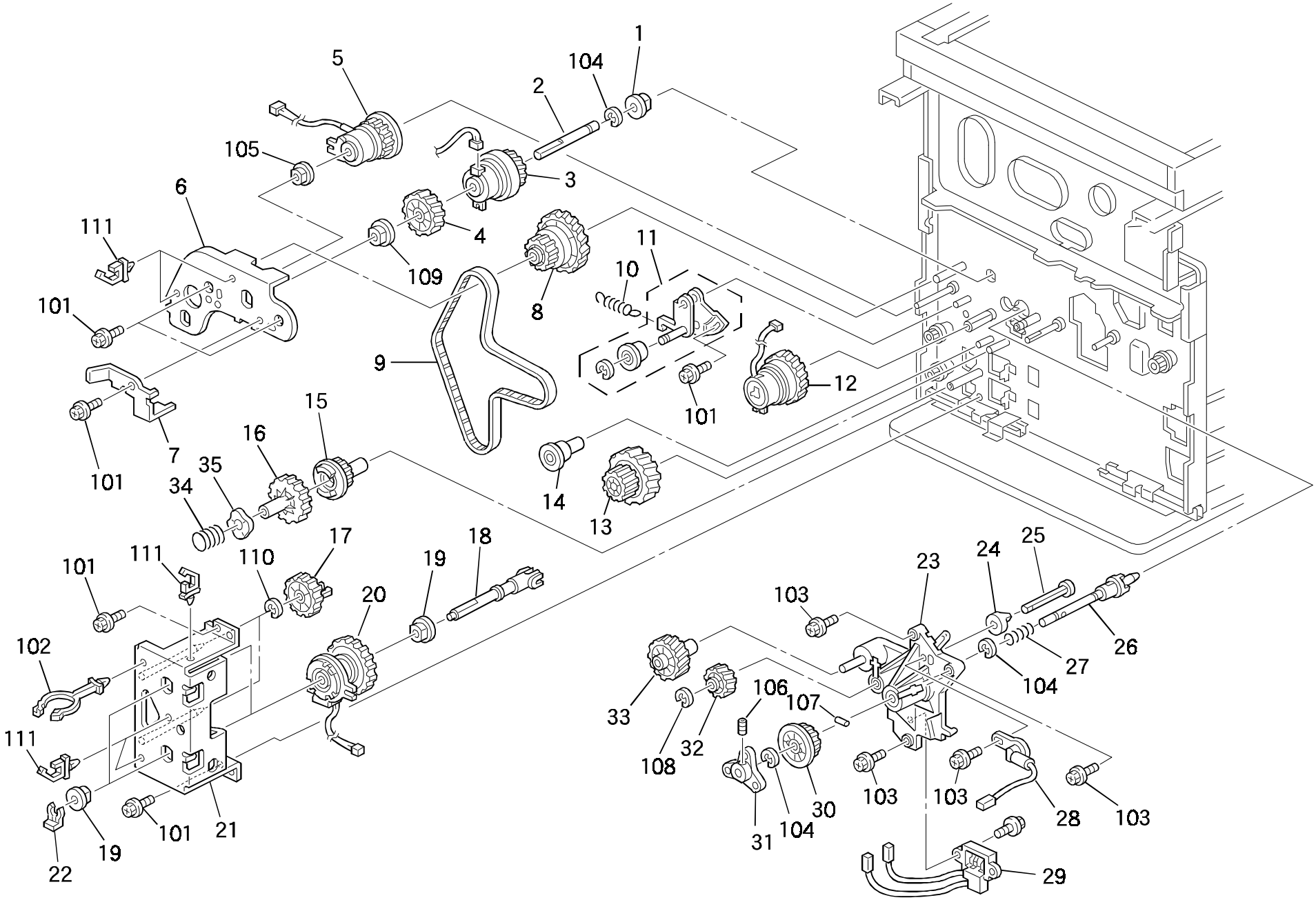


18. Drive Section 1 (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	G020 1189	Fly Wheel	2
2	G020 1187	Timing Belt - S2M 158 mm	1
3	A193 5865	Stand - IOB	1
4	G020 5434	Harness - Main Motor	1
5	G020 1125	Main Motor Ass'y - DC 24W	1
6	G020 1117	Charge Roller Contact Clutch	1
7	AA08 2070	Bushing - 8x16x7	1
8	G020 1196	Tighener - PCU Ass'y	1
9	G020 5839	Release Wire - Fusing Drive	1
10	G020 4438	Timing Belt - B60S2M-292	1
11	G020 4488	Pulley/Gear - 45Z/20Z	1
12	G020 1158	Support Bracket - Fusing Drive	1
13	G020 1153	Gear - 40Z	1
14	G020 1157	Gear - 28Z	1
15	G020 1167	Gear - 35Z	1
16	G020 4441	Idle Gear - 27Z	1
17	G020 1150	Fusing Drive Bracket	1
18	G020 4442	Idle Gear - 27Z	1
19	G020 4484	Tightener	1
20	G020 4330	Tightener Bracket	1
21	G020 4449	Spring - Tighlener	1
22	G020 1084	Tension Spring	1
23	AW02 0075	Photointerrupter	1
24	G020 2143	Actuator - Charge Roller Clutch	1
25	G020 2141	Bracket - Charge Roller Contact SN	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0451 3006B	Tapping Screw - M3x6	
102	0720 0040E	Retaining Ring - M4	
103	0451 3014B	Tapping Screw - M3x14	
104	1105 0460	Clamp	
105	0805 0088	Retaining Ring - M6	

19. Drive Section 2 (A193)

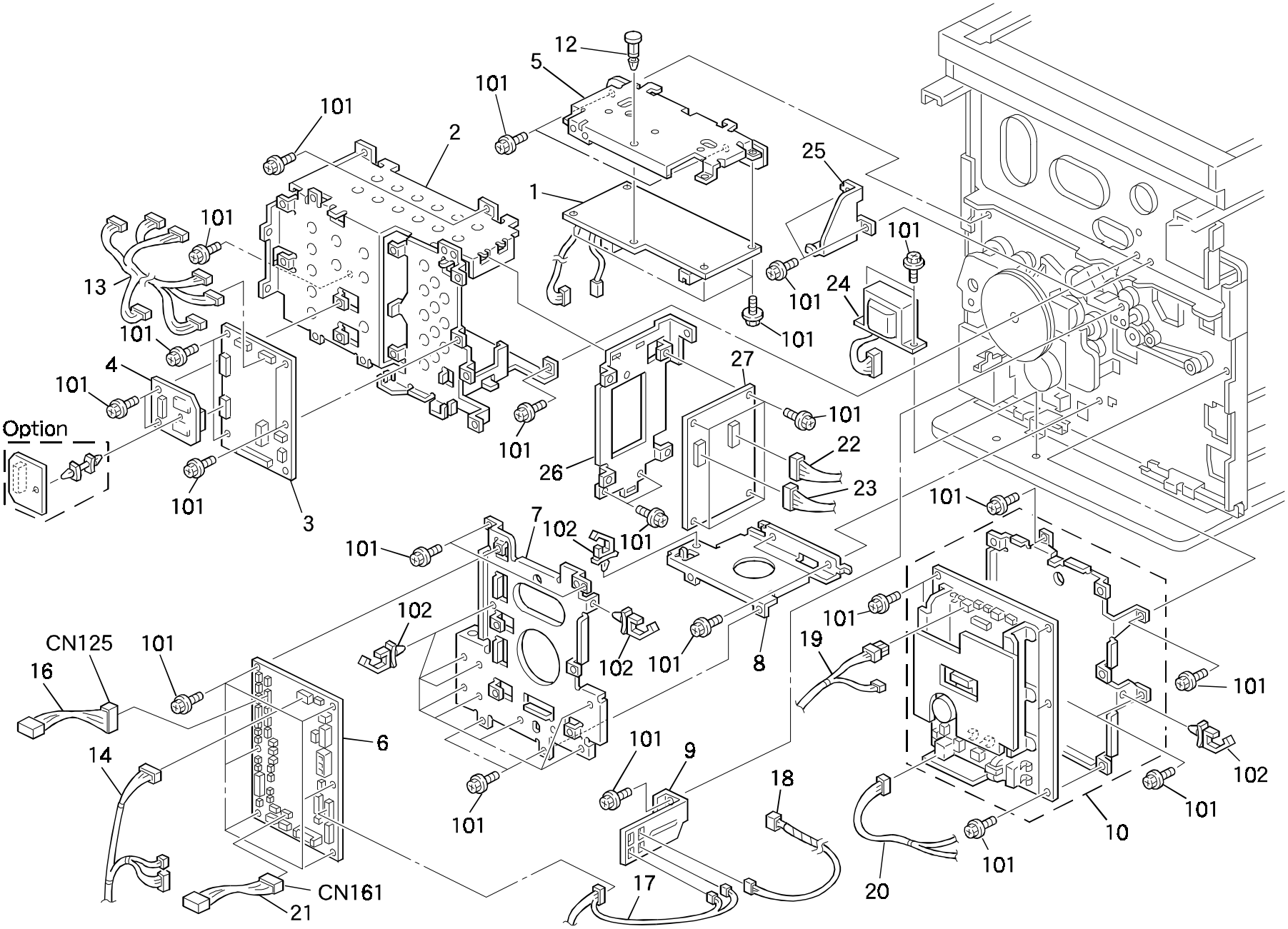


19. Drive Section 2 (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	AA08 2070	Bushing - 8x16x7	1
2	G020 1162	Development Clutch Shaft	1
3	G020 1116	Development Clutch	1
4	G020 1163	Gear - 43Z	1
5	G020 1114	By-pass Feed Clutch	1
6	G020 1165	Development Drive Bracket	1
7	G020 1166	Stopper Bracket - Development Clutch	1
8	G020 1147	Pulley - 65Z/26T	1
9	G020 1149	Timing Belt - S3M 588 mm	1
10	G020 1086	Spring - Tightener	1
11	G020 1190	Tightener Bracket Ass'y	1
12	G020 1115	Registration Clutch	1
13	G020 1168	Gear - 52Z/26T	1
14	G020 1146	Belt Tightener	1
15	G020 1148	Pulley - 30T	1
16	G020 1169	Gear - 40Z	1
17	G020 1144	Gear - 27Z	2
18	G020 1145	Shaft - Paper Feed Roller	2
19	G020 1119	Bushing - M8	4
20	G020 1112	Paper Feed Clutch	2
21	G020 1141	Bracket - Paper Feed Clutch	1
22	H521 3355	C Ring - Paper Feed Roller	1
23	G020 1171	Bracket - PCU Driver	1
24	G020 1186	Joint Bracket - Development Drive	1
25	G020 1185	Development Drive Shaft	1
26	G020 1180	PCU Drive Shaft	1
27	G020 1183	Pressure Spring	1
28	G020 2110	Terminal - Charge Roller	1
29	G020 3890	T/S Corona Recepacle	1
30	G020 1187	Timing Belt - S2M 158 mm	1
31	G020 1184	Bracket - Fly Wheel	1
32	G020 1177	Gear - 26Z	1
33	G020 1164	Gear - 37Z	1
34	G020 2682	Spring - 2.4N	1
35	5353 1803	Wabe Washer	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0451 3006B	Tapping Screw - M3x6	
102	1105 0458	Clamp - LHL-18	
103	0451 3014B	Tapping Screw - M3X14	
104	0720 0060E	Retaining Ring - M6	
105	0805 3385	Bushing - 6 mm	
106	0574 0050E	Hexagon Headless Set Screw - M4x5	
107	0633 0120E	Spring Pin - M3x12	
108	0720 0040E	Retaining Ring - M4	

20. Electrical Section 1 (A193)

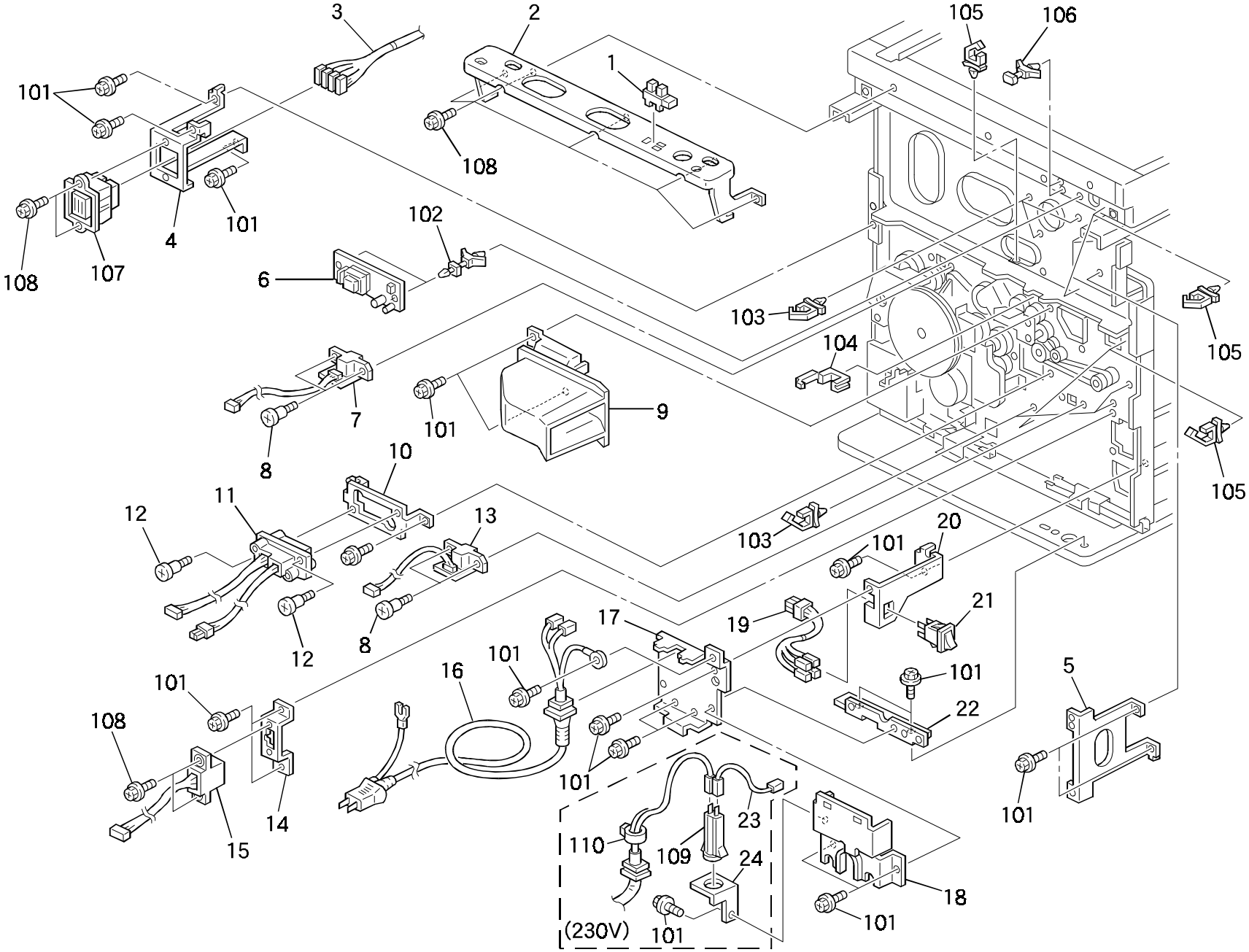


20. Electrical Section 1 (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	G020 5739	Power Pack - BCTD	1
2	A193 5803	Bracket - BICU Board	1
3	A193 5091	BICU Board (115V)	1
3	A193 5092	BICU Board (230V)	1
4	A193 5122	MSU - 4MB	1
5	G020 5870	Bracket - Power Pack	1
6	A193 5105	IOC Board	1
7	A193 5863	IOB - Bracket	1
8	A193 5864	IOB Support Bracket	1
9	A193 5820	Bracket - Harness Guide	1
10	A193 5800	DC Power Supply Board (115V)	1
10	A193 5061	DC Power Supply Board (230V)	1
11	A193 5730	Atabilizer - Xenon Lamp	1
12	G020 5871	Spacer - KGLS-12RF	1
13	A193 5414	Harness - Scanner Unit	1
14	A193 5419	Relay Harness - Scanner Unit	1
15	A193 5405	Relay Harness - Key Counter	1
16	G020 5404	Harness - PCU Detector	1
17	G020 5412	Harness - Fan Motor	1
18	A193 5474	Harness - Key Counter	1
19	A193 5452	Harness - Power Supply Board	1
20	A193 5459	Harness - Fusing Lamp	1
21	G020 5494	Invertor Relay Harness	1
22	A193 5451	DC Harness - Mother Board	1
23	A193 5490	Harness - Mother Board	1
24	AZ02 0010	Choke Coil - 10MH-2A	1
25	A193 1072	Harness Clamp Bracket	1
26	A193 5806	Bracket - Mother Board	1
27	A193 5128	Mother Board	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0451 3006B	Tapping Screw - M3x6	

21. Electrical Section 2 (A193)

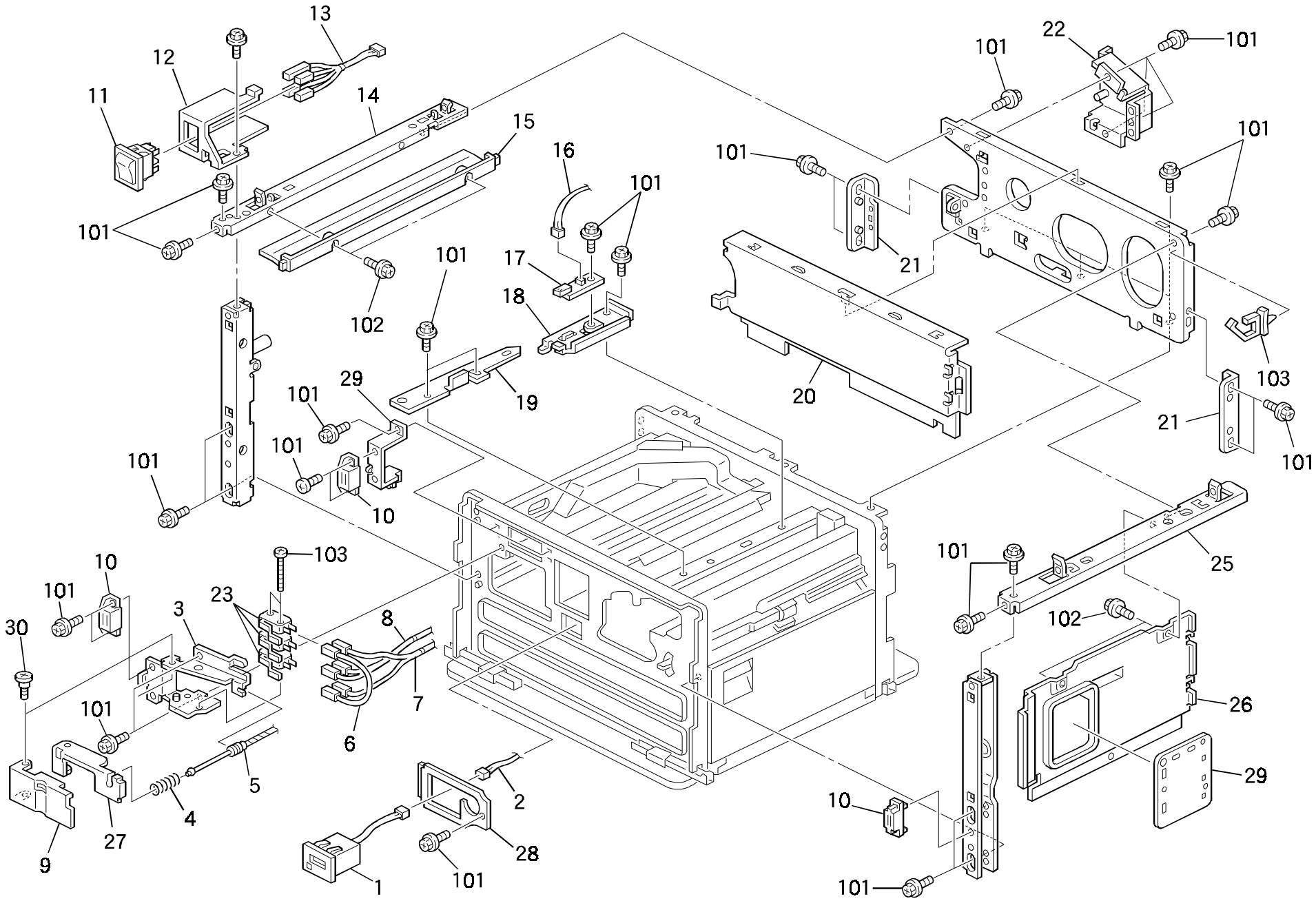


21. Electrical Section 2 (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	AW02 0075	Photointerrupter	1
2	A193 1786	Platen Cover Bracket	1
3	A193 5496	DF Relay Harness	1
4	A193 5808	ADF Connector - Bracket	1
5	A193 1364	Stand Cover	1
6	A193 5730	Atabilizer - Xenon Lamp	1
7	G020 5115	PCU Relay Board	1
8	G020 5829	Shoulder Screw - M3	4
9	A193 1101	Rear Duct	1
10	G020 5818	Bracket - Drawer Connector	1
11	A193 5211	Harness - Fusing Unit (115V)	1
11	A193 5214	Harness - Fusing Unit (230V)	1
12	AA14 3301	Stepped Screw - M3x4	1
13	G020 5116	Inverter Unit Connector	1
14	G020 5816	Bracket - Duplex Harness	1
15	G020 5497	Harness - Duplex Unit	1
16	A193 5711	Power Supply Cord (115V)	1
16	A193 5712	Power Supply Cord (230V)	1
17	A193 5858	Bracket - Power Supply Cord	1
18	A193 5861	Cover - Power Supply Cord	1
19	A193 5457	Harness - Main Switch	1
20	A193 5862	Stand - Power Supply Cord	1
21	G020 5616	Main Switch	1
22	G020 5862	Support Bracket - Base	1
23	A193 5215	Circuit Breaker Harness (230V)	1
24	A193 5817	Bracket - Circuit Breaker (230V)	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0451 3006B	Tapping Screw - M3x6	
102	1105 0195	PCB Stud	
103	1105 0291	Wire Saddle	
104	1105 0334	Edge - 17	
105	1105 0310	Wire Clamp	
106	1105 0415	Spacer - 12.7 mm	
107	1102 7445	Connector - 46P	
108	0451 3008B	Tapping Screw - M3x8	
109	1107 0472	Circuit Breaker - 250V/8A	
110	1607 0638	Ferrite Core - TFC25-15-12	

22. Frame Section 1 (A193)

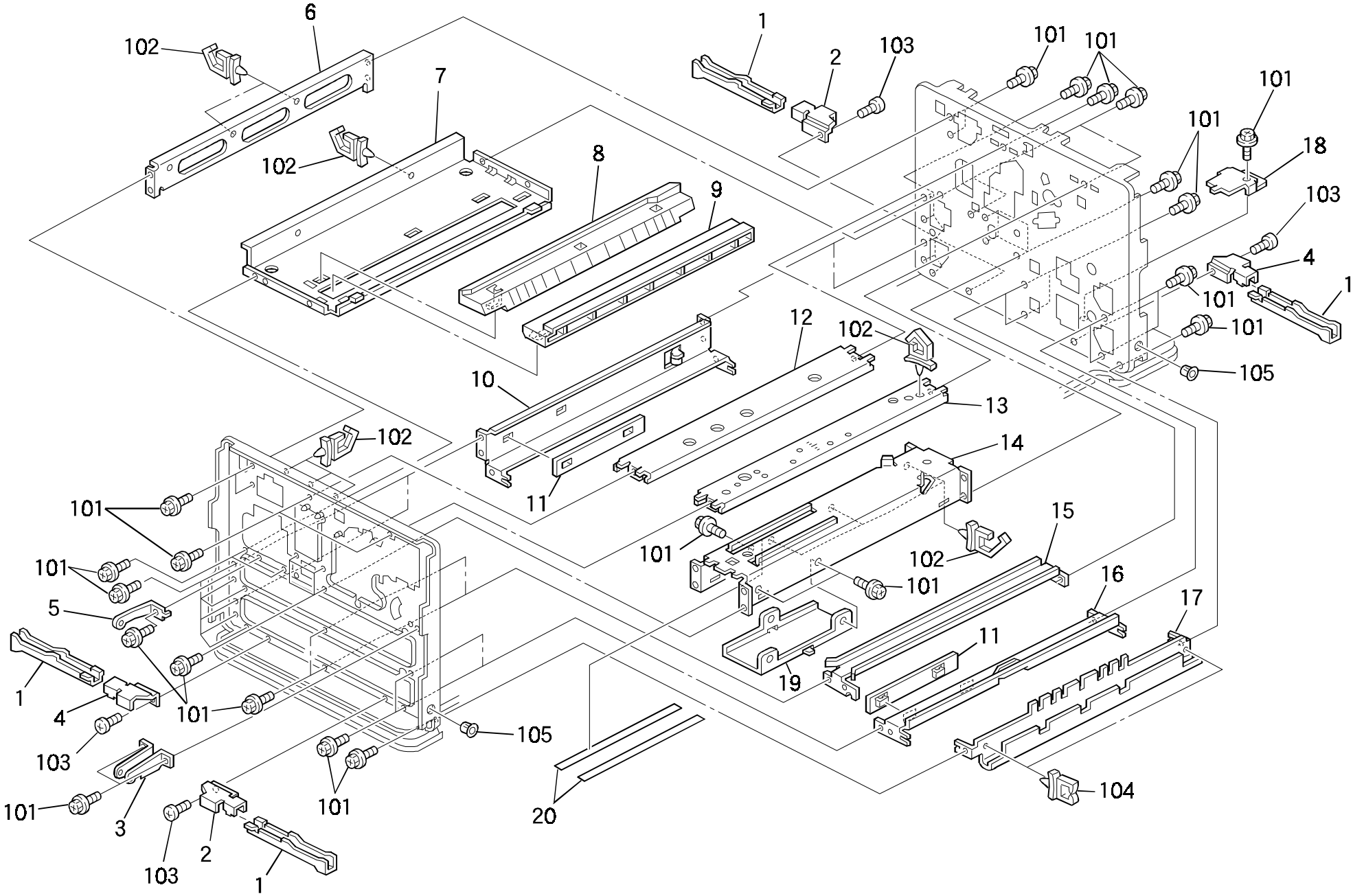


22. Frame Section 1 (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	AX31 0022	Total Counter	1
2	G020 5477	Relay Harness - Total Counter	1
3	G020 5810	Bracket - Door Switch	1
4	G020 5835	Tension Spring	1
5	G020 1159	Release Wire - Fusing Drive	1
6	G020 5486	Harness - Front Door SW	1
7	A193 5411	Harness Safety Switch - 5V	1
8	A193 5410	Harness Safety Switch - 24V	1
9	G020 5811	Safety Switch Actuator	1
10	AG07 0004	Magnetic Catch	3
11	1204 2446	Main Switch	1
12	A193 5809	Bracket - Operation Switch	1
13	A193 5456	Harness - Operation Switch	1
14	A193 1079	Left Lower Stay - Scanner Unit	1
15	A193 1321	Left Exit Cover	1
16	G020 5415	Harness - Humidity Sensor	1
17	G020 5625	Humidity Sensor	1
18	G020 2135	Bracket - Humidity Sensor	1
19	G020 1054	Positioning Plate	1
20	A193 1326	Rear Exit Cover	1
21	A193 1068	Rear Fixed Plate	1
22	A193 1083	Bracket - Sorter	1
23	G020 5812	Microswitch	1
24	A193 1382	Window Cover	1
25	A193 1077	Right Lower Stay - Scanner Unit	1
26	A193 1331	Right Exit Cover	1
27	G020 5815	Actuator - Release Gear	1
28	A193 5813	Bracket - Total Counter	1
29	G020 5813	Bracket - Magnet	1
30	G020 5829	Shoulder Screw - M3	1
31	G020 5486	Harness - Front Door SW	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0451 3006B	Tapping Screw - M3x6	
102	0802 5255	Tapping Screw - M3x8	
103	0313 0400B	Tapping Screw - M3x40	

23. Frame Section 2 (A193)



23. Frame Section 2 (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	A193 1070	Grip Plate	4
2	A134 1072	Right Bracket - Grip Plate	2
3	G020 1330	Right Hinge Bracket - Front Door	1
4	G020 1085	Bracket - Grip Plate	2
5	G020 1331	Left Hinge Bracket - Front Door	1
6	G020 1074	Harness Stay	1
7	G020 1073	Lower Left Plate	1
8	G020 1090	Left Relay Guide	1
9	G020 1087	Right Relay Guide	1
10	G020 2651	Left Guide - Paper Tray	1
11	G020 2678	Guide Plate - Paper Tray	1
12	G020 1071	Left Stay - Laser Unit	1
13	G020 1070	Right Stay - Laser Unit	1
14	G020 1072	Fusing Unit Guide	1
15	G020 2652	Stay - Paper Tray	1
16	G020 2650	Right Guide - Paper Tray	1
17	G020 2631	Stay - Vertical Transport	1
18	G020 1053	Guard Bracket	1
19	A193 1074	Relay Harness Cover	1
20	A193 1075	Sheet - Fusing Rail	2

Index No.	Part No.	Description	Q'ty Per Assembly
101	0451 3006B	Tapping Screw - M3x6	
102	1105 0291	Wire Saddle	
103	0434 0060B	Philips Tapping Screw - M4x6	

24. BICU Board (A193)

115V Model

AR

SYMBOL NO.	INDEX NO.
AR3	146
AR4	146
AR5	146
AR6	146
AR7	146
AR8	148
AR9	148
AR10	148
AR11	148
AR12	146

SYMBOL NO.	INDEX NO.
AR13	146
AR14	146
AR15	146
AR16	146
AR17	146
AR18	146
AR19	147
AR20	146
AR21	148
AR22	146

SYMBOL NO.	INDEX NO.
AR22	146
AR23	146
AR24	146
AR25	146
AR26	148
AR27	148
AR28	149

CAPACITOR

SYMBOL NO.	INDEX NO.
C1	187
C2	194
C3	195
C4	195
C5	185
C6	186
C7	186
C8	195
C9	150
C10	195

SYMBOL NO.	INDEX NO.
C11	195
C12	-----
C13	192
C14	192
C15	195
C16	151
C17	195
C18	192
C19	-----
C20	195

SYMBOL NO.	INDEX NO.
C21	188
C22	195
C23	195
C24	195
C25	192
C26	195
C27	192
C28	195
C29	151
C30	195

SYMBOL NO.	INDEX NO.
C31	191
C32	189
C33	195
C34	192
C35	195
C36	195
C37	184
C38	-----
C39	195
C40	195

CAPACITOR

SYMBOL NO.	INDEX NO.
C41	192
C42	195
C43	195
C44	195
C45	195
C46	195
C47	195
C48	195
C49	190
C50	195

SYMBOL NO.	INDEX NO.
C51	195
C52	193
C53	193
C54	193
C55	193
C56	195
C57	193
C58	195
C59	195
C60	195

SYMBOL NO.	INDEX NO.
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C63	193
C64	193
C65	193
C66	193
C67	193
C68	195
C69	195
C70	192

SYMBOL NO.	INDEX NO.
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C73	195
C74	192
C75	195
C76	195
C77	195
C78	195
C79	195
C80	195

SYMBOL NO.	INDEX NO.
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C83	192
C84	192
C85	192
C86	193
C87	193
C88	190
C89	190
C90	189

SYMBOL NO.	INDEX NO.
C91	189
C92	192
C93	192
C94	192
C95	192
C96	192
C97	191
C98	191
C99	191
C100	191

SYMBOL NO.	INDEX NO.
C101	191
C102	191
C103	191
C104	191
C105	191
C106	192
C107	192
C108	192
C109	192

CONNECTOR

SYMBOL NO.	INDEX NO.
CN301	110
CN302	105
CN303	106
CN304	110
CN305	103
CN306	107
CN307	102
CN308	104
CN309	101
CN310	109
CN311	108

DA

SYMBOL NO.	INDEX NO.
DA1	119
DA2	119
DA3	119
DA4	119
DA5	119
DA6	119
DA7	119
DA8	119

DIODE

SYMBOL NO.	INDEX NO.
D1	118
D2	118
D3	120

FILTER

SYMBOL NO.	INDEX NO.
FIL1	152
FIL2	152
FIL3	152
FIL4	152
FIL5	155
FIL6	152
FIL7	152
FIL8	152
FIL9	152
FIL10	153
FIL11	180

IC

SYMBOL NO.	INDEX NO.
IC2	132
IC4	137
IC5	2
IC6	1
IC7	136
IC8	135
IC9	139
IC10	3
IC11	141
IC12	124

SYMBOL NO.	INDEX NO.
IC13	124
IC14	134
IC15	140
IC16	134
IC17	142
IC18	127
IC19	125
IC20	128
IC21	126
IC22	126

SYMBOL NO.	INDEX NO.
IC23	126
IC24	124
IC26	129
IC27	4
IC28	130
IC29	127
IC30	127
IC31	127
IC99	138
[SOCKET]	111

JP

SYMBOL NO.	INDEX NO.
JP1	183
JP2	183
JP3	183
JP4	183

L

SYMBOL NO.	INDEX NO.
L1	154

LED

SYMBOL NO.	INDEX NO.
LED1	123
LED2	122

Q

SYMBOL NO.	INDEX NO.
Q1	114
Q2	116
Q3	114
Q4	113
Q5	115
Q6	114
Q7	117
Q8	114

RESISTOR

SYMBOL NO.	INDEX NO.
R1	163
R2	-----
R3	167
R4	173
R5	173
R6	-----
R7	173
R8	173
R9	173
R10	173

SYMBOL NO.	INDEX NO.
R11	165
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R13	156
R14	167
R15	167
R16	156
R17	165
R18	165
R19	163
R20	165

SYMBOL NO.	INDEX NO.
R21	165
R22	165
R23	165
R24	169
R25	-----
R26	162
R27	162
R28	162
R29	162
R30	162

SYMBOL NO.	INDEX NO.
R31	162
R32	162
R33	162
R34	162
R35	162
R36	160
R37	157
R38	158
R39	161
R40	158

24. BICU Board (A193)

115V Model

RESISTOR

SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.
R41	161	R51	161	R61	167	R71	167	R81	167	R91	167	R101	174
R42	158	R52	158	R62	174	R72	183	R82	167	R92	167	R102	174
R43	161	R53	161	R63	174	R73	173	R83	174	R93	173	R103	174
R44	158	R54	158	R64	174	R74	173	R84	174	R94	173	R104	167
R45	161	R55	161	R65	174	R75	173	R85	174	R95	173	R105	167
R46	158	R56	174	R66	167	R76	173	R86	-----	R96	173	R106	167
R47	161	R57	167	R67	173	R77	173	R87	174	R97	173	R107	167
R48	158	R58	-----	R68	167	R78	173	R88	174	R98	173	R108	167
R49	161	R59	167	R69	167	R79	173	R89	174	R99	174	R109	174
R50	158	R60	167	R70	167	R80	167	R90	167	R100	174	R110	174

RESISTOR

SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.
R111	174	R121	167	R131	167	R141	173	R151	173	R161	174	R171	177
R112	174	R122	173	R132	181	R142	156	R152	167	R162	167	R172	174
R113	173	R123	167	R133	182	R143	164	R153	174	R163	-----	R173	178
R114	174	R124	167	R134	170	R144	167	R154	167	R164	-----	R174	168
R115	174	R125	167	R135	166	R145	-----	R155	174	R165	166	R175	173
R116	174	R126	167	R136	-----	R146	167	R156	167	R166	173	R176	167
R117	174	R127	173	R137	167	R147	-----	R157	174	R167	173	R177	167
R118	167	R128	183	R138	165	R148	173	R158	167	R168	156	R178	166
R119	167	R129	167	R139	169	R149	173	R159	174	R169	165	R179	-----
R120	167	R130	-----	R140	173	R150	173	R160	167	R170	165	R180	-----

RESISTOR

SYMBOL NO.	INDEX NO.
R181	173
R182	177
R183	166
R184	176
R185	166
R186	170
R187	175
R188	171
R189	177
R190	166

SYMBOL NO.	INDEX NO.
R191	171
R192	174
R193	174
R194	175
R195	171
R196	173
R197	173
R198	167
R199	172
R200	173

SYMBOL NO.	INDEX NO.
R201	-----
R202	-----
R203	177
R204	174
R205	174
R206	174
R207	158
R208	158
R209	158
R210	158

SYMBOL NO.	INDEX NO.
R211	158
R212	158
R213	158
R214	158
R215	158
R216	159
R217	158
R218	159
R219	158
R220	177

SYMBOL NO.	INDEX NO.
R221	156
R222	157
R223	166
R224	167
R225	167
R226	177
R227	156
R228	156
R229	156
R230	177

SYMBOL NO.	INDEX NO.
R231	177
R232	177
R233	167
R234	179
R235	179
R236	179
R237	179
R238	179
R239	179
R240	179

SYMBOL NO.	INDEX NO.
R241	179
R242	179
R243	179
R244	179
R245	179
R246	179
R247	179
R248	177
R249	165
R250	173

RESISTOR

SYMBOL NO.	INDEX NO.
R251	166
R252	166
R253	166
R254	177
R255	177
R256	177
R257	177
R258	179
R259	179
R260	167

SYMBOL NO.	INDEX NO.
R261	167
R262	179
R263	165
R264	165
R265	173
R266	173
R267	173
R268	177

REG

SYMBOL NO.	INDEX NO.
REG1	143

SW

SYMBOL NO.	INDEX NO.
SW1	112

XTL

SYMBOL NO.	INDEX NO.
XTL1	144
XTL2	145

ZD

SYMBOL NO.	INDEX NO.
ZD1	121

24. BICU Board (A193)

230V Model

AR

SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.
AR1	197	AR11	146	AR21	148	AR31	199	AR41	146	AR51	146
AR2	197	AR12	149	AR22	148	AR32	201	AR42	201	AR52	146
AR3	197	AR13	197	AR23	146	AR33	201	AR43	199	AR53	146
AR4	197	AR14	197	AR24	146	AR34	199	AR44	148	AR54	146
AR5	201	AR15	197	AR25	146	AR35	199	AR45	148	AR55	146
AR6	197	AR16	197	AR26	200	AR36	146	AR46	148	AR56	148
AR7	199	AR17	146	AR27	198	AR37	146	AR47	148	AR57	146
AR8	146	AR18	146	AR28	200	AR38	146	AR48	147		
AR9	146	AR19	146	AR29	198	AR39	146	AR49	146		
AR10	146	AR20	146	AR30	201	AR40	146	AR50	146		

CAPACITOR

SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.
C1	187	C11	192	C21	184	C31	193	C41	191	C51	191
C2	194	C12	195	C22	195	C32	193	C42	191	C52	191
C3	195	C13	195	C23	192	C33	193	C43	191	C53	191
C4	180	C14	189	C24	195	C34	191	C44	191	C54	193
C5	180	C15	191	C25	195	C35	191	C45	191	C55	190
C6	193	C16	192	C26	195	C36	191	C46	191	C56	193
C7	195	C17	195	C27	193	C37	191	C47	191	C57	193
C8	195	C18	195	C28	195	C38	191	C48	191	C58	190
C9	195	C19	195	C29	151	C39	191	C49	191	C59	193
C10	195	C20	195	C30	193	C40	191	C50	191	C60	195

CAPACITOR

SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.
C61	192	C71	192	C81	192	C91	192	C101	192	C111	192
C62	193	C72	195	C82	195	C92	195	C102	195	C112	195
C63	193	C73	195	C83	195	C93	195	C103	195	C113	195
C64	193	C74	192	C84	195	C94	195	C104	195	C114	195
C65	193	C75	195	C85	195	C95	195	C105	195	C115	195
C66	188	C76	192	C86	195	C96	195	C106	195	C116	195
C67	193	C77	195	C87	195	C97	195	C107	195	C117	195
C68	195	C78	151	C88	195	C98	195	C108	195	C118	195
C69	195	C79	195	C89	195	C99	195	C109	195	C119	195
C70	195	C80	195	C90	195	C100	195	C110	195	C120	195

CAPACITOR

SYMBOL NO.	INDEX NO.
C81	195
C82	195
C83	195
C84	195
C85	195
C86	195
C87	195
C88	193
C89	193
C90	193

SYMBOL NO.	INDEX NO.
C91	195
C92	195
C93	195
C94	195
C95	195
C96	192
C97	195
C98	195
C99	195
C100	190

SYMBOL NO.	INDEX NO.
C101	195
C102	192
C103	192
C104	195
C105	195
C106	189
C107	190
C108	195
C109	192
C110	192

SYMBOL NO.	INDEX NO.
C111	193
C112	193
C113	192
C114	195
C115	195
C116	193
C117	193
C118	193
C119	193
C120	150

SYMBOL NO.	INDEX NO.
C121	195
C122	195
C123	192
C124	193
C125	193
C126	192
C127	193
C128	193
C129	193
C130	193

SYMBOL NO.	INDEX NO.
C131	193
C132	193
C133	193
C134	189
C135	193
C136	193
C137	185
C138	195
C139	193
C140	193

SYMBOL NO.	INDEX NO.
C141	195
C142	195

CONNECTOR

SYMBOL NO.	INDEX NO.
CN301	110
CN302	105
CN303	106
CN304	110
CN305	103
CN306	107
CN307	102
CN308	104
CN309	101
CN310	109
CN311	108

DA

SYMBOL NO.	INDEX NO.
DA1	119
DA2	119
DA3	119
DA4	119
DA5	119
DA6	119
DA7	119
DA8	119

DIODE

SYMBOL NO.	INDEX NO.
D1	118
D2	118
D3	118

FILTER

SYMBOL NO.	INDEX NO.
FIL1	202
FIL2	202
FIL3	202
FIL4	202
FIL5	202
FIL6	204
FIL7	156
FIL8	156
FIL9	156
FIL10	156

SYMBOL NO.	INDEX NO.
FIL11	156
FIL12	202
FIL13	156
FIL14	156
FIL15	156
FIL16	156
FIL17	156
FIL18	156
FIL19	156
FIL20	156

SYMBOL NO.	INDEX NO.
FIL21	203
FIL22	203
FIL23	156
FIL24	202
FIL25	202
FIL26	202
FIL27	202
FIL28	202
FIL29	157

IC

SYMBOL NO.	INDEX NO.
IC2	132
IC3	128
[SOCKET]	111
IC4	129
IC5	136
IC6	2
IC7	135
IC8	1
IC9	133
IC10	136

24. BICU Board (A193)

230V Model

IC

SYMBOL NO.	INDEX NO.
IC11	4
IC12	139
IC13	3
IC14	141
IC15	124
IC16	124
IC17	135
IC18	140
IC19	130
IC20	127

SYMBOL NO.	INDEX NO.
IC21	127
IC22	142
IC23	127
IC24	127
IC25	196
IC26	126
IC27	126
IC28	126
IC29	196

JP

SYMBOL NO.	INDEX NO.
JP3	180
JP4	180
JP5	180

LED

SYMBOL NO.	INDEX NO.
LED1	123
LED2	122

Q

SYMBOL NO.	INDEX NO.
Q1	114
Q2	114
Q3	116
Q4	113
Q5	117
Q6	114
Q7	115
Q8	114

REG

SYMBOL NO.	INDEX NO.
REG1	143

RESISTOR

SYMBOL NO.	INDEX NO.
R1	179
R2	167
R3	167
R4	173
R5	179
R6	179
R7	179
R8	179
R9	173
R10	177

RESISTOR

SYMBOL NO.	INDEX NO.
R11	171
R12	166
R13	177
R14	171
R15	174
R16	167
R17	165
R18	169
R19	165
R20	165

SYMBOL NO.	INDEX NO.
R21	163
R22	173
R23	167
R24	164
R25	167
R26	173
R27	156
R28	173
R29	205
R30	156

SYMBOL NO.	INDEX NO.
R31	167
R32	167
R33	174
R34	174
R35	167
R36	167
R37	170
R38	-----
R39	167
R40	166

SYMBOL NO.	INDEX NO.
R41	169
R42	167
R43	167
R44	167
R45	173
R46	174
R47	174
R48	174
R49	167
R50	167

SYMBOL NO.	INDEX NO.
R51	167
R52	173
R53	173
R54	174
R55	174
R56	174
R57	174
R58	173
R59	167
R60	167

SYMBOL NO.	INDEX NO.
R61	167
R62	167
R63	167
R64	181
R65	182
R66	170
R67	166
R68	166
R69	165
R70	165

SYMBOL NO.	INDEX NO.
R71	167
R72	177
R73	173
R74	167
R75	167
R76	173
R77	173
R78	173
R79	173
R80	167

24. BICU Board (A193)

230V Model

RESISTOR

SYMBOL NO.	INDEX NO.
R81	166
R82	166
R83	166
R84	165
R85	165
R86	173
R87	173
R88	177
R89	177
R90	177

SYMBOL NO.	INDEX NO.
R91	177
R92	165
R93	165
R94	177
R95	177
R96	177
R97	177
R98	168
R99	178
R100	174

SYMBOL NO.	INDEX NO.
R101	173
R102	167
R103	167
R104	166
R105	173
R106	173
R107	173
R108	165
R109	166
R110	177

SYMBOL NO.	INDEX NO.
R111	173
R112	176
R113	166
R114	179
R115	173
R116	177
R117	173
R118	174
R119	167
R120	177

SYMBOL NO.	INDEX NO.
R121	177
R122	175
R123	167
R124	167
R125	167
R126	179
R127	179
R128	179
R129	179
R130	171

SYMBOL NO.	INDEX NO.
R131	173
R132	173
R133	172
R134	167
R135	174
R136	174
R137	174
R138	174
R139	158
R140	158

SYMBOL NO.	INDEX NO.
R141	158
R142	158
R143	158
R144	158
R145	158
R146	158
R147	158
R148	159
R149	158
R150	159

RESISTOR

SYMBOL NO.	INDEX NO.
R151	158
R152	179
R153	177
R154	163
R200	206
R201	206
R202	206

SW

SYMBOL NO.	INDEX NO.
SW1	112

XTL

SYMBOL NO.	INDEX NO.
XTL1	144
XTL2	145

ZD

SYMBOL NO.	INDEX NO.
ZD1	121

24. BICU Board (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
*	A193 5120	BICU Board (115V)	1
*	A193 5134	BICU Board (230V)	1
1	A193 5510	IC - BU6206KV	1
2	A193 5520	IC - GAPD	1
3	A193 5550	IC - ADIPU M66359FP	1
4	G018 5914	IC - FCI 1.6	1
101	1102 7324	Connector Header - 16P	
102	1102 7383	Connector FC-102H	
103	1102 7452	Connector DF11-22DP - 2V	
104	1102 7453	Connector FX2-80S-1.27SVL	
105	1102 7454	Connector FX6-60P-0.8SV2	
106	1102 7455	Connector FX6-60S-0.8SV2	
107	1102 7456	Connector 176125-5	
108	1102 7463	Connector KX14-70K8D1	
109	1102 7465	Connector IL-FHR-20S-HF	
110	1102 7466	Connector IL-FHR-50S-HF	
111	1104 0759	IC Socket 28P 2-382409-3	
112	1204 2373	Key Board Switch - SKQDPA	
113	1400 0390	TR 2SA1122D	
114	1400 0392	Transistor - DTC114EK	
115	1400 0398	Transistor - 2SC2412K	
116	1400 0702	Transistor - DTD143EK	
117	1400 0703	Transistor - 2SA1313	
118	1402 0477	Silicon Diode - 1SS187	
119	1402 0478	Diode - 1SS226TE85L	
120	1402 0804	Silicon Diode - 45V - 0.3A	
121	1402 1111	Diode - HZM5.1NB2	
122	1403 0828	Diode - SEC1901C	
123	1403 0829	Diode - SEC1201C	
124	1407 1600	TTLIC - SN74LS244NS	
125	1407 2143	TTLIC - 74F244SJ	
126	1407 2187	TTLIC - SN74LS07NS	
127	1407 2561	TTLIC 74F157ASJ	
128	1407 2948	IC - TC7S04F	
129	1407 3263	IC - TC7S08F	
130	1407 4179	CMOSIC TC7W04FU	
131	1407 4322	IC - TD74ABT374F	
132	1407 4336	PSRAM	
133	1407 4536	IC - ICS1574	
134	1407 4657	IC - RS5μF1050	
135	1407 4671	FIFO M66256FP	
136	1407 4683	MPU HD6413003TF-10	
137	1407 4685	EEPROM LH28F800SUT-70	
138	1407 4730	SRAM STK12C68-W45	

Index No.	Part No.	Description	Q'ty Per Assembly
139	1407 4734	IC - M66257FP	
140	1408 0575	IC - M51957BFP	
141	1408 0797	CMOSIC TC74HC03AF	
142	1408 1065	Comparator BA10339F	
143	1408 1226	Regurator 3.3V PQ3TZ53	
144	1503 0587	Oscillator CX-5F 19.6608MHZ	
145	1503 0704	Oscillator CSTCS16.00MX040	
146	1601 1413	Resistor - RCB8C330J	
147	1601 7751	Resistor - 4.7K Ω ±5%	
148	1601 7752	Resistor - 10K Ω ±5%	
149	1601 7797	Resistor Array - 100 Ω ±5%	
150	1604 4333	Capacitor - 100μF ±20% 10V	
151	1605 0577	Capacitor - 0.33μF +80-20%	
152	1607 0705	Noize Filter - ACF51832-470	
153	1607 0706	Noize Filter - ACF51832-220	
154	1607 0723	Noize Filter - N2012Z121	
155	1607 0803	Filter - ACF451832-680	
156	1607 0847	Data Line Filter - ACB1608H-300	
157	1607 0907	EMI Filter - ACB2012H-300	
158	1630 3102	Resistor - 1KΩ 1/10W ±5%	
159	1630 3103	Resistor - 10KΩ 1/10W ±5%	
160	1630 3150	Resistor - 15Ω ±5% 1/10W	
161	1630 3222	Resistor - 2.2K Ω 1/10W ±5%	
162	1630 3330	Resistor - 33 Ω ±5% 1/10W	
163	1630 3471	Resistor - 470Ω - 1/10W	
164	1630 4100	Resistor - 10 Ω ±5% 1/16W	
165	1630 4101	Resistor - 100 Ω ±5% 1/16W	
166	1630 4102	Resistor - 100 Ω ±5% 1/16W	
167	1630 4103	Resistor - 10KΩ ±5% 1/16W	
168	1630 4104	Resistor - 100 Ω ±5% 1/16W	
169	1630 4105	Resistor - 1.0MΩ ±5% 1/16W	
170	1630 4222	Resistor - 2.2K Ω ±5%	
171	1630 4223	Resistor - 22K Ω ±5% - 1/16W	
172	1630 4273	Resistor - 27K Ω ±5% - 1/16W	

Index No.	Part No.	Description	Q'ty Per Assembly
173	1630 4330	Resistor - 33 Ω ±5% 1/8W	
174	1630 4332	Resistor - 33K Ω ±5% 1/16W	
175	1630 4333	Resistor - 33K Ω: ±5% 1/16W	
176	1630 4471	Resistor - 470 Ω ±5% 1/16W	
177	1630 4472	Resistor - 4.7K Ω ±5% 1/16W	
178	1630 4510	Resistor - 51 Ω ±5% 1/16W	
179	1630 4680	Resistor - 68 Ω ±5% 1/16W	
180	1633 0000	Resistor - 0 Ω 1/10W - Jamper Chip	
181	1633 1002	Resistor - 10K Ω ±1% 1/10W	
182	1633 3921	Resistor - 3.92K Ω ±1% 1/10W	
183	1634 0000	Resistor - 0 Ω - 1/16W	
184	1644 0220	Capacitor - 22μF ±20% 10V	
185	1644 0470	Capacitor - 47μF ±20% 10V	
186	1644 2100	Capacitor - 10μF ±20% 25V	
187	1644 5100	Capacitor - 10μF ±20% 50V	
188	1644 6220	Capacitor - 22μF ±20% 6.3V	
189	1660 1100	Capacitor - 10PF 50V	
190	1660 3101	Capacitor - 100PF 50V	
191	1660 3150	Capacitor - 15PF 50V	
192	1660 3471	Capacitor - 470PF 50V	
193	1660 7103	Capacitor - 10000PF 50V	
194	1660 7104	Capacitor - 100000PF 50V	
195	1660 9104	Capacitor - 0.1μF 25V	
196	1407 4323	TTL TD74ABT244A	
197	1601 1930	Resistor - 100 Ω ±5% 1/10W	
198	1601 7792	Resistor - 1k Ω	
199	1601 7793	Resistor - 10k Ω	
200	1601 7796	Resistor Array - 2.2k Ω ±5%	
201	1601 7814	Resistor - 3.3k Ω ±5%	
202	1607 0732	Noize Filter - AEF321825-470	
203	1607 0926	Frilter - ACF321825-680	
204	1607 0927	Frilter - ACF321825-220	
205	1630 4150	Resistor - 15 Ω ±5% 1/16W	
206	1630 4301	Resistor - 300 Ω ±5% 1/10W	

25. IOCSS Board (A193)

CAPACITOR

SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.
C101	-----	C111	173	C121	168	C131	174	C141	173	C151	174	C161	173
C102	173	C112	172	C122	170	C132	173	C142	173	C152	174	C162	174
C103	173	C1\13	172	C123	168	C133	173	C143	173	C153	174	C163	173
C104	169	C114	173	C124	173	C134	173	C144	173	C154	173	C164	173
C105	173	C115	-----	C125	174	C135	173	C145	173	C155	174	C165	173
C106	173	C116	173	C126	-----	C136	173	C146	171	C156	173	C166	173
C107	174	C117	173	C127	168	C137	173	C147	173	C157	174	C167	-----
C108	-----	C118	171	C128	173	C138	173	C148	173	C158	-----	C168	174
C109	173	C119	149	C129	174	C139	173	C149	173	C159	173	C169	173
C110	173	C120	149	C130	171	C140	173	C150	173	C160	173	C170	173

CAPACITOR

SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.
C171	173	C181	173	C191	173	C201	173	C211	173	C221	173	C231	173
C172	173	C182	174	C192	173	C202	173	C212	172	C222	173	C232	173
C173	173	C183	174	C193	173	C203	173	C213	174	C223	173	C233	173
C174	173	C184	173	C194	173	C204	174	C214	173	C224	173	C234	172
C175	174	C185	174	C195	173	C205	174	C215	173	C225	173	C235	173
C176	174	C186	174	C196	173	C206	173	C216	173	C226	173	C236	173
C177	173	C187	173	C197	174	C207	173	C217	173	C227	173	C237	-----
C178	173	C188	174	C198	173	C208	173	C218	173	C228	173	C238	173
C179	173	C189	174	C199	173	C209	173	C219	173	C229	173	C239	-----
C180	173	C190	-----	C200	174	C210	173	C220	173	C230	173	C240	149

CAPACITOR

SYMBOL NO.	INDEX NO.
C241	173
C242	173
C243	173
C244	173
C245	173
C246	173
C247	173
C248	173
C249	173
C250	173

SYMBOL NO.	INDEX NO.
C251	173
C252	173
C253	173
C254	173
C255	173
C256	173
C257	173
C258	173
C259	173
C260	173
C263	173

CONNECTOR

SYMBOL NO.	INDEX NO.
CN101	129
CN102	125
CN103	114
CN104	104
CN105	127
CN106	123
CN107	111
CN108	103
CN109	112
CN110	111

SYMBOL NO.	INDEX NO.
CN111	103
CN112	121
CN113	128
CN116	115
CN117	117
CN118	103
CN119	124
CN120	122
CN121	109
CN122	116

SYMBOL NO.	INDEX NO.
CN123	118
CN124	110
CN125	106
CN126	105
CN130	132
CN131	106
CN132	119
CN134	133
CN136	102
CN137	126

SYMBOL NO.	INDEX NO.
CN150	107
CN151	131
CN153	130
CN157	120
CN160	115
CN161	106
CN162	108
CN170	113

DIODE

SYMBOL NO.	INDEX NO.
D101	154
D102	137
D103	137
D104	136
D105	136
D106	136

FIB

SYMBOL NO.	INDEX NO.
FIB101	100
FIB102	100
FIB103	100
FIB104	100
FIB105	100

FUSE

SYMBOL NO.	INDEX NO.
FS101	134

IC

SYMBOL NO.	INDEX NO.
IC101	143
IC102	140
IC103	142
IC104	140
IC105	140
IC106	141
IC107	-----
IC108	140
IC109	141
IC110	139

SYMBOL NO.	INDEX NO.
IC111	-----
IC112	145
IC113	141
IC114	141
IC115	140
IC116	140
IC117	140
IC118	144
IC119	141

RAY

SYMBOL NO.	INDEX NO.
RAY101	148
RAY102	148
RAY103	148
RAY104	148
RAY105	148
RAY106	148
RAY107	148
RAY108	148
RAY109	148
RAY114	148

SYMBOL NO.	INDEX NO.
RAY115	147
RAY116	148
RAY117	148
RAY118	147
RAY119	148
RAY120	148
RAY121	148
RAY122	148
RAY123	148
RAY124	148

SYMBOL NO.	INDEX NO.
RAY125	148
RAY126	148
RAY127	148
RAY128	148
RAY129	148
RAY130	148
RAY131	148
RAY132	148
RAY133	148
RAY134	148

25. IOCSS Board (A193)

RAY

SYMBOL NO.	INDEX NO.
RAY135	148
RAY136	147
RAY137	148
RAY138	148
RAY139	148
RAY140	148
RAY141	148
RAY142	148

RESISTOR

SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.
R101	154	R111	160	R121	152	R131	150	R141	160	R151	152
R102	162	R112	152	R122	152	R132	156	R142	155	R152	146
R103	161	R113	150	R123	160	R133	150	R143	151	R153	156
R104	167	R114	151	R124	157	R134	156	R144	152	R154	158
R105	152	R115	158	R125	160	R135	150	R145	152	R155	-----
R106	164	R116	160	R126	158	R136	156	R146	151	R156	156
R107	155	R117	150	R127	156	R137	150	R147	152	R157	156
R108	154	R118	151	R128	156	R138	156	R148	152	R158	152
R109	152	R119	154	R129	151	R139	150	R149	152	R159	-----
R110	155	R120	151	R130	150	R140	152	R150	152	R160	-----

RESISTOR

SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.	SYMBOL NO.	INDEX NO.
R161	-----	R171	166	R181	152	R191	-----	R201	152	R211	151	R221	166
R162	-----	R172	158	R182	152	R192	-----	R202	151	R212	155	R222	161
R163	-----	R173	152	R183	152	R193	161	R203	152	R213	158	R223	151
R164	-----	R174	150	R184	156	R194	152	R204	151	R214	-----	R224	159
R165	-----	R175	152	R185	152	R195	155	R205	152	R215	155	R225	151
R166	151	R176	152	R186	152	R196	158	R206	156	R216	156	R226	152
R167	156	R177	152	R187	158	R197	152	R207	166	R217	155	R227	155
R168	-----	R178	152	R188	152	R198	165	R208	152	R218	155	R228	158
R169	163	R179	152	R189	154	R199	152	R209	155	R219	151	R229	157
R170	152	R180	156	R190	151	R200	151	R210	156	R220	158	R230	155

25. IOCSS Board (A193)

RESISTOR

SYMBOL NO.	INDEX NO.
R231	152
R232	152
R233	154
R234	158
R235	155
R236	152
R237	152
R238	155
R239	155
R240	152

SYMBOL NO.	INDEX NO.
R241	152
R242	-----
R243	151
R244	151
R245	166
R246	152
R247	152
R248	-----
R249	-----
R250	151

TP

SYMBOL NO.	INDEX NO.
TP105	101

25. IOCSS Board (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
*	A193 5105	IOC Board	1

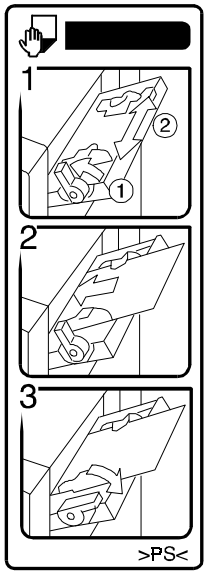
Index No.	Part No.	Description	Q'ty Per Assembly
100	1002 0307	Jumper Wire	
101	1100 1474	Test Pin - Red	
102	1102 3822	Connector - HIF3FC-20PA-2.54DSA	
103	1102 4201	Connector - 2P	
104	1102 4202	Connector - 3P	
105	1102 4203	CT Header - 4P	
106	1102 4204	CT Header - 5P	
107	1102 4205	CT Header - 6P	
108	1102 4207	Connector - 8P	
109	1102 4209	CT Header - 10P	
110	1102 4211	CT Header - 12P	
111	1102 4619	Connector - 2P	
112	1102 4620	CT Header - 3P	
113	1102 4621	CT Header - 4P	
114	1102 4623	CT Connector - 6P	
115	1102 4631	CT Connector - 2P	
116	1102 4634	CT Connector - 5P	
117	1102 4643	CT Connector - 2P	
118	1102 4648	CT Connector - 7P	
119	1102 4818	Connector - 20P	
120	1102 5007	CT Header - 14P	
121	1102 5301	Connector - 2P	
122	1102 5844	Connector - 5566-02A	
123	1102 6295	Connector - 2P	
124	1102 6300	Connector - 7P	
125	1102 6303	Connector - 10P	
126	1102 6304	Connector - 11P	
127	1102 6515	Connector - 34P	
128	1102 6662	Connector - 4P	
129	1102 6895	Connector - 40P	
130	1102 6957	Connector - 14P	
131	1102 6958	Connector - 14P	
132	1102 7513	Header - 80P	
133	1102 7583	Connector - 5566-06A - RE	
134	1107 0898	Fuse 3216CP - 3A	

Index No.	Part No.	Description	Q'ty Per Assembly
135	1400 0700	Transistor - DTD133HK	
136	1402 1144	Diode - 150MW 1SS319	
137	1402 1327	Diode - 2.0V	
138	1403 0404	LED - SEL2110R	
139	1407 1535	IC - TD62308AP	
140	1407 2187	TTLIC - SN74LS07NS	
141	1407 2219	IC - TD62003AP	
142	1407 4565	IC - TE6251	
143	1408 0595	IC - NJM2904M	
144	1408 1204	IC - TA8083P	
145	1408 1225	IC - STK672-040	
146	1600 1449	Resistor - 47 Ω 3W	
147	1601 7800	Resistor Array - 1K Ω ±5% 1/16W	
148	1601 7801	Resistor Array - 10K Ω ±5% 1/16W	
149	1605 0447	Capacitor - 10PF 50V	
150	1630 2221	Resistor - 220 Ω	
151	1630 3102	Resistor - 1KΩ 1/10W ±5%	
152	1630 3103	Resistor - 10KΩ 1/10W ±5%	
153	1630 3154	Resistor - 150K 0HM ±5% 1/10W	
154	1630 3220	Resistor - 22 Ω ±5% 1/10W	
155	1630 3243	Resistor - 24KΩ ±5% 1/10W	
156	1630 3332	Resistor - 3.3KΩ 1/10W ±5%	
157	1630 3391	Resistor - 390 Ω 1/10W ±5%	
158	1630 3472	Resistor - 4.7KΩ 1/10W ±5%	
159	1630 3820	Resistor - 82 Ω ±5% 1/10W	
160	1632 3900	Resistor - 390 Ω ±1% 1/10W	
161	1633 1001	Resistor - 1K Ω ±1% 1/10W	
162	1633 1002	Resistor - 10K Ω ±1% 1/10W	
163	1633 1201	Resistor - 1.2K Ω ±1% 1//10W	
164	1633 3301	Resistor - 3.3K Ω ±1% 1/10W	
165	1633 3901	Resistor - 3.9 Ω ±1% 1/10W	
166	1633 4700	Resistor - 470 Ω - ±1% - 1/10W	
167	1633 4701	Resistor - 4.7K Ω ±1% 1/10W	
168	1640 5101	Capacitor - 100µF ±20% 50V	

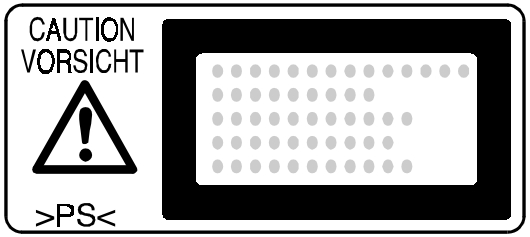
Index No.	Part No.	Description	Q'ty Per Assembly
169	1642 1101	Capacitor - 100µF ±20% 16V	
170	1642 1470	Capacitor - 47µF ±20% 16V	
171	1643 5100	Capacitor - 10µF ±20% 50V	
172	1660 3471	Capacitor - 470PF 50V	
173	1660 7103	Capacitor - 10000PF 50V	
174	1660 7104	Capacitor - 100000PF 50V	
175	A193 5863	IOB - Bracket	
176	0451 3006B	Tapping Screw - M3x6	
177	1105 0239	Spacer	
178	1105 0344	Clamp	
179	1105 0409	Spacer	
180	A193 5820	Bracket - Harness Guide	
181	A193 5823	Bracket - Finisher	
182	A193 5826	Shield Plate	
183	A193 5864	IOB Support Bracket	
184	A193 5865	Stand - IOB	
185	A193 5871	Rear Cover Bracket - Right	
186	A193 5872	Rear Cover Bracket - Middle	
187	0451 3006B	Tapping Screw - M3x6	

26. Decal and Document (A193)

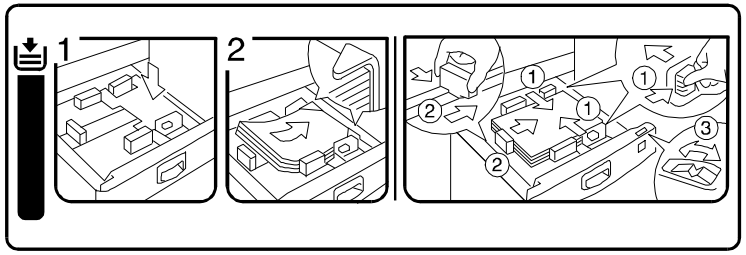
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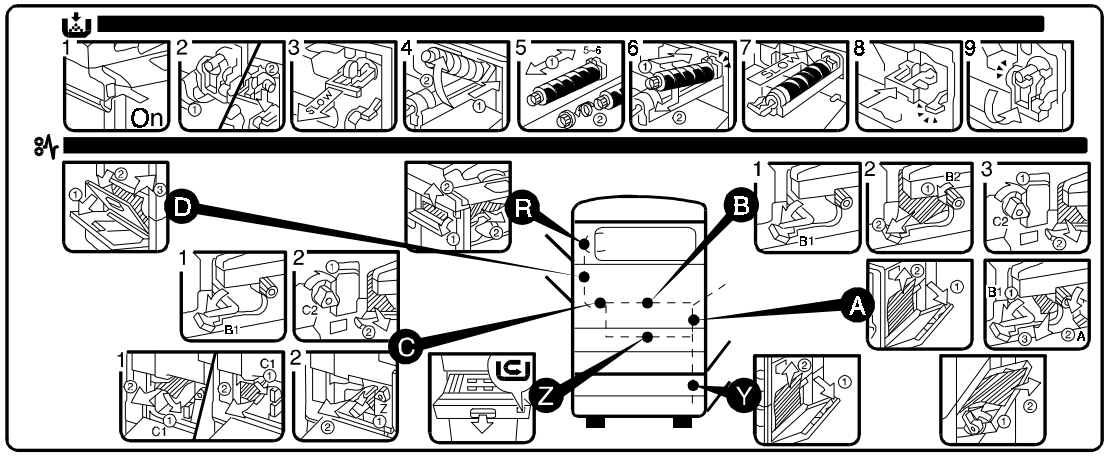
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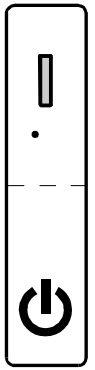
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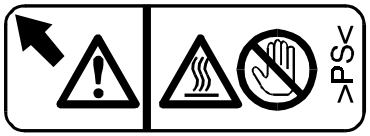
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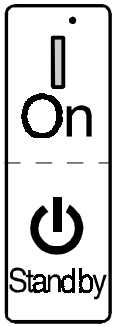
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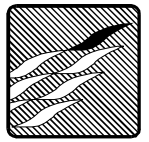
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8



9



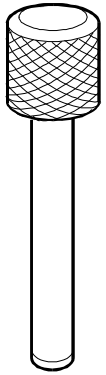
26. Decal and Document (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	G020 2788	Decal - By-pass Table	1
2	G020 1919	Decal - Optics Fiber	1
3	G020 2668	Decal - Paper Set	1
4	G020 1917	Decal - LD	1
5	A193 1319	Operation Decal	1
6	A193 7361	Decal - Main Switch	1
7	G020 4128	Decal - High Temparature	1
8	A193 7363	Decal - AC Switch	1
9	A134 1380	Emblem (GES)	1
9	A133 7112	Emblem (SVN)	1
9	A134 1383	Emblem (RIC/LEN)	1

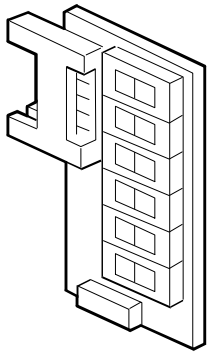
Index No.	Part No.	Description	Q'ty Per Assembly

27. Special Tools (A193)

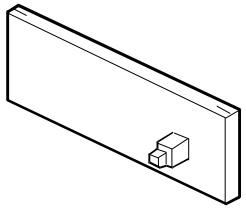
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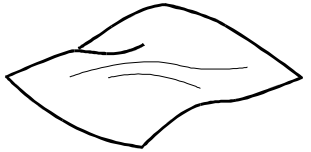
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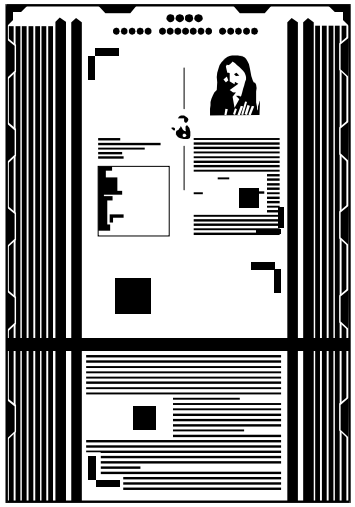
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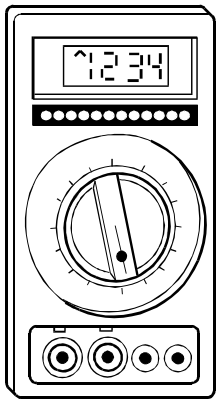
4



5



6



27. Special Tools (A193)

Index No.	Part No.	Description	Q'ty Per Assembly
1	A006 9104	Scanner Positioning Pin (4PCS/SET)	1
2	A139 9351	ROM Board 2	1
3	A193 9353	Flash ROM/SRAM Copy Tool 2	1
4	A153 9004	Wiping Cloth (for the Drum Charge RO)	1
5	5420 9516	Test Chart - OS-A3 (10 PCS/SET)	1
6	5420 9507	Digital Multimeter	1

Index No.	Part No.	Description	Q'ty Per Assembly

PARTS INDEX

PM Parts Index

Section Name	Part No.	Description in Service Manual	Description in Parts Catalog	Q'ty Per Assembly	Page and Index No
Paper Feed Section (A193)	G020 2555	Paper Feed Roller	Paper Feed Roller	1	21- 26
Fusing Unit (A193)	G020 4170	Fusing Hot Roller	Hot Roller	1	33- 17
Fusing Unit (A193)	G020 4178	Fusing Stripper	Hot Roller Stripper	1	33- 2
Fusing Unit (A193)	G020 4180	Fusing Pressure Roller	Pressure Roller	1	33- 19
Paper Exit Section (A193)	A673 3881	Transfer and Sepapration Unit	Transfer and Sepapration Unit	1	35- 16

Parts Index

Part No.	Description	Page and Index No.
A193 1068	Rear Fixed Plate	49- 21
A193 1070	Grip Plate	51- 1
A193 1072	Harness Clamp Bracket	45- 25
A193 1074	Relay Harness Cover	51- 19
A193 1075	Sheet - Fusing Rail	51- 20
A193 1077	Right Lower Stay - Scanner Unit	49- 25
A193 1079	Left Lower Stay - Scanner Unit	49- 14
A193 1083	Bracket - Sorter	49- 22
A193 1090	Bracket - PCU	19- 30
A193 1101	Rear Duct	47- 9
A193 1207	Lower Left Cover	9- 3
A193 1210	Lower Rear Cover	9- 6
A193 1246	Platen Cover Hinge Ass'y	11- 9
A193 1251	Scanner Left Cover	7- 3
A193 1256	Upper Rear Cover	7- 10
A193 1261	Scanner Right Cover	7- 11
A193 1266	Lower Cover - Operation Panel	7- 1
A193 1276	Middle Left Cover	9- 4
A193 1281	Rear Right Cover	9- 12
A193 1291	Lower Right Cover	9- 14
A193 1301	Front Cover	7- 18
A193 1316	Lower Exit Cover	9- 21
A193 1317	Platen Cover Bracket	11- 5
A193 1319	Operation Decal	7- 21
A193 1319	Operation Decal	63- 5
A193 1321	Left Exit Cover	49- 15
A193 1326	Rear Exit Cover	49- 20
A193 1331	Right Exit Cover	49- 26
A193 1336	Left Front Cover	7- 17
A193 1341	Right Front Cover	7- 16
A193 1345	Rivet - M20	9- 13
A193 1348	Cap - G4	9- 7
A193 1349	Cap - Sorter	9- 22
A193 1350	Cap - NCU	9- 8
A193 1352	Cap - CSS	9- 10

Part No.	Description	Page and Index No
A193 1354	Cap - Memory	9- 9
A193 1356	Cap - IC Card	9- 2
A193 1358	Cap - RS232C	9- 1
A193 1361	Cap - Paper Tray Unit	9- 11
A193 1364	Stand Cover	47- 5
A193 1366	Fan Cover	9- 23
A193 1381	Platen Cover Actuator	11- 3
A193 1382	Window Cover	49- 24
A193 1386	Front Platen Cover	11- 4
A193 1391	Rear Platen Cover	11- 2
A193 1396	Original Holder	11- 1
A193 1451	Operation Panel Ass'y (LT)	7- 2
A193 1451	Operation Panel Ass'y (LT)	13- *
A193 1452	Operation Sub-unit (A4)	7- 2
A193 1452	Operation Panel Ass'y (A4)	13- *
A193 1453	Operation Sub-unit (SVN)	7- 2
A193 1455	Operation Panel Case (LT)	13- 1
A193 1456	Decal - Operation Panel (LT)	13- 4
A193 1457	Sheet - Operation Panel (LT)	13- 5
A193 1458	Key Top - Memory (LT)	13- 13
A193 1459	Operation Board (LT)	13- 20
A193 1460	LCD (LT)	13- 19
A193 1461	Key Top - 10 Key (LT)	13- 11
A193 1462	Operation Panel Board (A4)	13- 20
A193 1465	Operation Panel Case (A4)	13- 1
A193 1466	Decal - Operation Panel (A4)	13- 4
A193 1467	Sheet - Operation Panel (A4)	13- 5
A193 1468	Key Top - Memory (A4)	13- 13
A193 1469	LCD (A4)	13- 19
A193 1472	Lower Case - Operation Panel	13- 2
A193 1473	Upper Cover - Operation Panel	13- 18
A193 1474	Lower Cover - Operation Panel	7- 8
A193 1474	Lower Cover - Operation Panel	13- 3
A193 1477	Key Top - Start	13- 6
A193 1478	Key Top - Clear Mode	13- 7

Part No.	Description	Page and Index No.
A193 1479	Key Top - Interrupt	13- 8
A193 1480	Key Top - Program Mode	13- 9
A193 1481	Key Top - Clear	13- 10
A193 1482	Key Top - 10 Key (A4)	13- 11
A193 1483	Key Top - LCD	13- 12
A193 1483	Key Top - LCD	13- 21
A193 1485	Key Top - Initial	13- 14
A193 1486	Key Top - Behind	13- 15
A193 1487	Right Cover - Operation Panel	13- 16
A193 1488	Cover - Apprication	13- 17
A193 1501	Front Door (RIC)	7- 14
A193 1669	2nd/3rd Mirror	25- 3
A193 1673	Lens Holder Ass'y	23- 9
A193 1680	Left Original Scale	7- 4
A193 1682	Scanner Drive Pulley Ass'y	25- 17
A193 1689	Right Inner Cover - Scanner Unit	23- 8
A193 1690	Scanner Motor - DC 5.64W	25- 23
A193 1754	Bracket - Left Origial Scale	23- 2
A193 1757	Rear Original Scale	7- 6
A193 1759	Stepped Screw	7- 12
A193 1760	1st Scanner Ass'y	25- 11
A193 1764	1st Mirror	25- 13
A193 1766	Wire Clamp	25- 7
A193 1767	1st Mirror Holder	25- 12
A193 1769	Wire Clamp	25- 10
A193 1770	2nd Scanner Ass'y	25- 2
A193 1776	Upper Harness Guide	25- 4
A193 1777	2nd/3rd Mirror Holder	25- 1
A193 1781	Lower Harness Guide	23- 4
A193 1783	Tension Spring	25- 21
A193 1784	Tension Spring	25- 19
A193 1786	Platen Cover Bracket	47- 2
A193 1790	Grounding Plate - Lens Block	23- 1
A193 1799	Harness Guide - Exposure Lamp	25- 9
A193 1819	Front Seal - Scanner Frame	23- 10

Part No.	Description	Page and Index No
A193 1824	Left Inner Cover - Scanner Unit	23- 3
A193 1826	Lens Block Holder	23- 7
A193 1829	Ball Bearing - M8	25- 15
A193 1832	Front Scanner Pulley	25- 18
A193 1838	Scanner Drive Wire	25- 20
A193 1840	Timing Belt - L220 B8	25- 16
A193 1841	Pulley - Front Left	25- 5
A193 1845	Pulley - Rear Left	25- 14
A193 1849	Tension Bracket	25- 22
A193 1853	Laser Unit (115V)	27- 3
A193 1855	Laser Unit (230V)	27- 3
A193 1861	LD Unit Ass'y (115V)	27- 4
A193 1865	LD Unit Ass'y (230V)	27- 4
A193 2649	Paper Size Detector (LT)	17- 7
A193 2650	Paper Size Detector (A4)	17- 7
A193 3367	Cover Guide - Toner Bottle (A4)	19- 6
A193 3371	Cover Guide - Toner Bottle (OEM)	19- 6
A193 4017	Fusing Unit (115V)	33- *
A193 4027	Fusing Unit (230V)	33- *
A193 4183	Fusing Unit Harness (115V)	33- 28
A193 4184	Fusing Unit Harness (230V)	33- 28
A193 4187	Fusing Lamp - 120V 800W	33- 14
A193 4188	Header - 230V 700W	33- 14
A193 5061	DC Power Supply Board (230V)	45- 10
A193 5091	BICU Board (115V)	45- 3
A193 5092	BICU Board (230V)	45- 3
A193 5105	IOC Board	45- 6
A193 5105	IOC Board	61- *
A193 5120	BICU Board (115V)	57- *
A193 5122	MSU - 4MB	45- 4
A193 5128	Mother Board	45- 27
A193 5134	BICU Board (230V)	57- *
A193 5211	Harness - Fusing Unit (115V)	47- 11
A193 5214	Harness - Fusing Unit (230V)	47- 11
A193 5215	Circuit Breaker Harness (230V)	47- 23

Part No.	Description	Page and Index No.
A193 5220	LD Unit Harness (115V)	27- 1
A193 5405	Relay Harness - Key Counter	45- 15
A193 5410	Harness Safety Switch - 24V	49- 8
A193 5411	Harness Safety Switch - 5V	49- 7
A193 5414	Harness - Scanner Unit	23- 6
A193 5414	Harness - Scanner Unit	45- 13
A193 5419	Relay Harness - Scanner Unit	45- 14
A193 5438	Relay Harness - Polygon Mirror Motor	27- 5
A193 5451	DC Harness - Mother Board	45- 22
A193 5452	Harness - Power Supply Board	45- 19
A193 5456	Harness - Operation Switch	49- 13
A193 5457	Harness - Main Switch	47- 19
A193 5459	Harness - Fusing Lamp	45- 20
A193 5474	Harness - Key Counter	45- 18
A193 5490	Harness - Mother Board	45- 23
A193 5496	DF Relay Harness	47- 3
A193 5510	IC - BU6206KV	57- 1
A193 5520	IC - GAPD	57- 2
A193 5550	IC - ADIPU M66359FP	57- 3
A193 5702	Exposure Lamp	25- 6
A193 5703	Exposure Lamp Harness	25- 8
A193 5711	Power Supply Cord (115V)	47- 16
A193 5712	Power Supply Cord (230V)	47- 16
A193 5730	Atabilizer - Xenon Lamp	45- 11
A193 5730	Atabilizer - Xenon Lamp	47- 6
A193 5742	LD Unit Harness (230V)	27- 1
A193 5800	DC Power Supply Board (115V)	45- 10
A193 5803	Bracket - BICU Board	45- 2
A193 5806	Bracket - Mother Board	45- 26
A193 5808	ADF Connector - Bracket	47- 4
A193 5809	Bracket - Operation Switch	49- 12
A193 5813	Bracket - Total Counter	49- 28
A193 5817	Bracket - Circuit Breaker (230V)	47- 24
A193 5820	Bracket - Harness Guide	45- 9
A193 5820	Bracket - Harness Guide	61-180

Part No.	Description	Page and Index No
A193 5823	Bracket - Finisher	61-181
A193 5826	Shield Plate	61-182
A193 5858	Bracket - Power Supply Cord	47- 17
A193 5861	Cover - Power Supply Cord	47- 18
A193 5862	Stand - Power Supply Cord	47- 20
A193 5863	IOB - Bracket	45- 7
A193 5863	IOB - Bracket	61-175
A193 5864	IOB Support Bracket	45- 8
A193 5864	IOB Support Bracket	61-183
A193 5865	Stand - IOB	41- 3
A193 5865	Stand - IOB	61-184
A193 5871	Rear Cover Bracket - Right	61-185
A193 5872	Rear Cover Bracket - Middle	61-186
A193 5906	Original Sensor	23- 5
A193 7214	Front Door (INF)	7- 14
A193 7224	Front Door (SVN)	7- 14
A193 7226	Front Door (GES/LAN)	7- 14
A193 7361	Decal - Main Switch	63- 6
A193 7363	Decal - AC Switch	63- 8
A193 9353	Flash ROM/SRAM Copy Tool 2	65- 3
A193 9800	Tray Heater - 115V	21- 27
A193 9801	Tray Heater - 230V	21- 27

Part No.	Description	Page and Index No.
AA06 0331	Release Spring	19- 14
AA08 2070	Bushing - 8x16x7	19- 11
AA08 2070	Bushing - 8x16x7	35- 22
AA08 2070	Bushing - 8x16x7	41- 7
AA08 2070	Bushing - 8x16x7	43- 1
AA14 3301	Stepped Screw - M3x4	47- 12
AA16 2067	Platen Cover Pad	11- 7
AB01 3868	Gear - 16Z	17- 13
AE04 2009	Cleaning Roller	33- 22
AF02 0283	Pressure Roller	21- 34
AF04 0031	Upper Exit Roller	37- 13
AF04 0031	Upper Exit Roller	39- 38
AG07 0004	Magnetic Catch	49- 10
AW02 0075	Photointerrupter	21- 20
AW02 0075	Photointerrupter	23- 11
AW02 0075	Photointerrupter	39- 29
AW02 0075	Photointerrupter	41- 23
AW02 0075	Photointerrupter	47- 1
AX31 0022	Total Counter	49- 1
AX40 0088	Anticondensation Heater - 115V	23- 12
AX40 0089	Anticondensation Heater - 230V	23- 12
AX64 0058	Fan Motor - DC 24V 4.32W	37- 7
AZ02 0010	Choke Coil - 10MH-2A	45- 24
G011 3305	Gear - 16T	15- 11
G012 1531	Magnet	37- 15
G012 1531	Magnet	39- 11
G012 4865	Exit Roller	39- 6
G018 5914	IC - FCI 1.6	57- 4
G020 1052	Stand	7- 7
G020 1053	Guard Bracket	51- 18
G020 1054	Positioning Plate	49- 19
G020 1070	Right Stay - Laser Unit	51- 13
G020 1071	Left Stay - Laser Unit	51- 12
G020 1072	Fusing Unit Guide	51- 14
G020 1073	Lower Left Plate	51- 7

Part No.	Description	Page and Index No
G020 1074	Harness Stay	51- 6
G020 1084	Tension Spring	41- 22
G020 1085	Bracket - Grip Plate	51- 4
G020 1086	Spring - Tightener	43- 10
G020 1087	Right Relay Guide	51- 9
G020 1088	Front Guide - Fusing Unit	35- 27
G020 1090	Left Relay Guide	51- 8
G020 1096	Right Shielding Plate	21- 2
G020 1098	Stay - OPU	35- 3
G020 1100	Duct	37- 8
G020 1104	Fan Motor Holder	37- 6
G020 1105	Cushion - Fan Motor	37- 25
G020 1106	Right Duct	35- 2
G020 1107	Nut - M4	37- 24
G020 1111	Motor - DC 2.16W	19- 7
G020 1112	Paper Feed Clutch	43- 20
G020 1113	Relay Roller Clutch	21- 22
G020 1114	By-pass Feed Clutch	43- 5
G020 1115	Registration Clutch	43- 12
G020 1116	Development Clutch	43- 3
G020 1117	Charge Roller Contact Clutch	41- 6
G020 1119	Bushing - M8	43- 19
G020 1125	Main Motor Ass'y - DC 24W	41- 5
G020 1141	Bracket - Paper Feed Clutch	43- 21
G020 1144	Gear - 27Z	43- 17
G020 1145	Shaft - Paper Feed Roller	43- 18
G020 1146	Belt Tightener	43- 14
G020 1147	Pulley - 65Z/26T	43- 8
G020 1148	Pulley - 30T	43- 15
G020 1149	Timing Belt - S3M 588 mm	43- 9
G020 1150	Fusing Drive Bracket	41- 17
G020 1153	Gear - 40Z	41- 13
G020 1157	Gear - 28Z	41- 14
G020 1158	Support Bracket - Fusing Drive	41- 12
G020 1159	Release Wire - Fusing Drive	49- 5

Part No.	Description	Page and Index No.
G020 1161	Bracket - Toner Supply Motor	19- 8
G020 1162	Development Clutch Shaft	43- 2
G020 1163	Gear - 43Z	43- 4
G020 1164	Gear - 37Z	43- 33
G020 1165	Development Drive Bracket	43- 6
G020 1166	Stopper Bracket - Development Clutch	43- 7
G020 1167	Gear - 35Z	41- 15
G020 1168	Gear - 52Z/26T	43- 13
G020 1169	Gear - 40Z	43- 16
G020 1171	Bracket - PCU Driver	43- 23
G020 1177	Gear - 26Z	43- 32
G020 1180	PCU Drive Shaft	43- 26
G020 1183	Pressure Spring	43- 27
G020 1184	Bracket - Fly Wheel	43- 31
G020 1185	Development Drive Shaft	43- 25
G020 1186	Joint Bracket - Development Drive	43- 24
G020 1187	Timing Belt - S2M 158 mm	41- 2
G020 1187	Timing Belt - S2M 158 mm	43- 30
G020 1189	Fly Wheel	41- 1
G020 1190	Tightener Bracket Ass'y	43- 11
G020 1194	Bracket - Fusing Drive Gear	35- 24
G020 1196	Tighener - PCU Ass'y	41- 8
G020 1316	Inner Cover - Paper Feed Tray	9- 18
G020 1326	Cap - Inverter Unit	9- 20
G020 1327	Knob Screw - M3	9- 5
G020 1327	Knob Screw - M3	9- 25
G020 1330	Right Hinge Bracket - Front Door	51- 3
G020 1331	Left Hinge Bracket - Front Door	51- 5
G020 1332	Hinge Front Door	7- 13
G020 1351	Cap - Finisher	9- 24
G020 1900	Laser Unit Case	27- 25
G020 1902	Lower Cover - Laser Unit	27- 10
G020 1903	Right Holder - BTL Lens	27- 11
G020 1904	Left Holder - BTL Lens	27- 12
G020 1905	Cylindrical Lens Holder	27- 13

Part No.	Description	Page and Index No
G020 1906	Left Holder - F Theta Mirror	27- 15
G020 1907	Right Holder - F Theta Mirror	27- 16
G020 1908	1st Mirror Holder	27- 17
G020 1909	2nd Mirror Holder	27- 20
G020 1910	Laser Unit Cover	27- 21
G020 1911	Sync Detector Mirror	27- 9
G020 1912	Sync Detector	27- 2
G020 1915	Sync Detector Mirror Holder	27- 8
G020 1917	Decal - LD	63- 4
G020 1919	Decal - Optics Fiber	63- 2
G020 1923	CS Ring - M2.4	27- 22
G020 1928	2nd Mirror - Laser Unit	27- 23
G020 1961	Polygon Mirror Motor	27- 6
G020 1962	Shield Glass	27- 24
G020 1964	1st Mirror - Laser Unit	27- 18
G020 1966	Cylindrical Lens	27- 14
G020 1969	BTL Lens	27- 19
G020 2020	Charge Roller Ass'y	31- 1
G020 2103	Tension Spring	35- 6
G020 2104	Quenching Lamp	35- 5
G020 2105	Bracket - Quenching Lamp	35- 4
G020 2106	Bushing - Pressure Lever	35- 23
G020 2107	Pressure Lever - Charge Roller	35- 7
G020 2110	Terminal - Charge Roller	43- 28
G020 2121	CAM - Charge Roller	35- 9
G020 2135	Bracket - Humidity Sensor	49- 18
G020 2141	Bracket - Charge Roller Contact SN	41- 25
G020 2143	Actuator - Charge Roller Clutch	41- 24
G020 2148	Grounding Plate - Quenching Lamp	35- 8
G020 2554	Paper Feed Roller Ass'y	21- 7
G020 2555	Paper Feed Roller	21- 26
G020 2560	Front Side Fence	17- 5
G020 2561	Front Paper Separator	17- 14
G020 2564	Relay Roller	21- 8
G020 2565	Paper Guide	21- 28

Part No.	Description	Page and Index No.
G020 2567	Rear Side Fence	17- 6
G020 2568	Rear Paper Separator	17- 15
G020 2570	Shaft - Paper Feed Roller	21- 31
G020 2575	Guide Plate - Vertical Transport	21- 16
G020 2577	Spring Plate - Driven Roller	21- 35
G020 2580	Paper End Sensor Bracket	21- 23
G020 2581	Paper End Feeler	21- 6
G020 2584	Photointerruptor	21- 10
G020 2585	Front Shaft - Paper Feed Roller	21- 30
G020 2586	Rear Shaft - Paper Feed Roller	21- 29
G020 2587	Bushing - Paper Feed	21- 1
G020 2589	Bracket - Vertical Transport Sensor	21- 9
G020 2592	Release Lever - Bottom Plate	17- 9
G020 2599	Spring - Release Lever	17- 8
G020 2610	Left Vertical Transport Guide	21- 11
G020 2613	Virtical Relay Guide	21- 12
G020 2615	Microswitch	21- 25
G020 2616	Bracket - Microswitch	21- 13
G020 2618	Stay - Paper End Sensor	21- 15
G020 2620	Paper Size Detector	9- 16
G020 2622	Release Arm - Paper End Feeler	21- 24
G020 2625	Holder - Vertical Transport Guide	21- 32
G020 2626	Release Spring - Paper End Feeler	21- 19
G020 2630	Magnetic Catch	21- 33
G020 2631	Stay - Vertical Transport	51- 17
G020 2643	Front Grounding Plate - Paper Tray	21- 18
G020 2644	End Fence	17- 10
G020 2645	Friction Pad	17- 12
G020 2647	Paper Tray Cover	17- 1
G020 2648	Holder - Paper Size Detector	17- 4
G020 2650	Right Guide - Paper Tray	51- 16
G020 2651	Left Guide - Paper Tray	51- 10
G020 2652	Stay - Paper Tray	51- 15
G020 2654	Upper Rear Guide - Paper Tray	21- 4
G020 2655	Upper Front Guide - Paper Tray	21- 3

Part No.	Description	Page and Index No
G020 2656	Pressure Spring - Bottom Plate	17- 3
G020 2658	Grounding Plate - Bottom Plate	17- 2
G020 2661	Bottom Plate Ass'y	17- 11
G020 2664	Front Stopper Lever	17- 16
G020 2668	Decal - Paper Set	63- 3
G020 2676	Support - Paper Tray - Right	9- 15
G020 2677	Support - Paper Tray - Left	9- 19
G020 2678	Guide Plate - Paper Tray	51- 11
G020 2682	Spring - 2.4N	43- 34
G020 2701	Cover - By-pass Table	15- 2
G020 2702	Pressure Spring - By-pass Feed Table	15- 13
G020 2705	Right Side Fence - By-pass Feed	15- 5
G020 2706	Left Side Fence - By-pass Feed	15- 3
G020 2707	Sensor Conductor - By-pass Feed	15- 6
G020 2708	Spring Plate - By-pass Feed	15- 10
G020 2709	Bottom Plate - By-pass Table	15- 7
G020 2713	Pressure Spring	19- 18
G020 2714	Friction Pad - By-pass Feed	19- 17
G020 2719	Stay - By-pass Feed	19- 19
G020 2721	By-pass Feed Roller	19- 22
G020 2723	By-pass Feed Shaft	19- 29
G020 2735	Guide - By-pass Feed Table	15- 1
G020 2740	Lower Registration Roller	19- 10
G020 2742	Upper Registration Roller	19- 9
G020 2743	Tension Spring	19- 3
G020 2744	Gear - 16Z	19- 20
G020 2745	Lower Guide Plate - Regist	19- 12
G020 2753	Bracket - Registration Sensor	19- 23
G020 2754	Upper Paper Guide	19- 16
G020 2761	Lower Transport Guide	19- 15
G020 2765	Knob - Lower Transport Guide	19- 13
G020 2771	Registration Sensor	19- 24
G020 2772	By-pass Paper End Sensor	19- 25
G020 2780	Front Bushing - Registration	19- 4
G020 2781	Rear Bushing - Registration Roller	19- 31

Part No.	Description	Page and Index No.
G020 2782	Stay - By-pass Table	15- 12
G020 2783	Registration Roller Knob	7- 19
G020 2783	Registration Roller Knob	19- 2
G020 2784	Lever - By-pass Feed Table	15- 15
G020 2785	Cover - Feed Roller Shaft	19- 27
G020 2786	Shaft - By-pass Release Lever	15- 16
G020 2787	Cover - By-pass Paper End Sensor	19- 26
G020 2788	Decal - By-pass Table	63- 1
G020 3311	Cover - Toner Supply	29- 1
G020 3312	Gate - Toner Supply	29- 6
G020 3313	Spring - Toner Supply Cover	29- 4
G020 3314	Toner Supply Unit	29- 9
G020 3317	Shutter - Toner Supply	29- 5
G020 3320	Hook - Toner Supply Unit	29- 10
G020 3322	Cover - Toner Supply Unit	29- 14
G020 3325	Sheet - Agitator	29- 15
G020 3334	Slider - Toner Supply	29- 12
G020 3339	Handle - Toner Supply	29- 8
G020 3340	Lower Seal - Toner Supply	29- 2
G020 3345	Right Seal - Toner Supply	29- 3
G020 3361	Guide Plate - Toner Supply	19- 21
G020 3365	Cover Guide - Toner Bottle (LT)	19- 6
G020 3550	Cleaning Blade	31- 2
G020 3852	Transfer Roller	35- 25
G020 3880	Transport Guide Plate	35- 13
G020 3882	Grounding Plate - Transfer Guide	35- 14
G020 3887	Fan Motor - DC 3.12W	35- 15
G020 3888	Pin - Transfer Guide	19- 1
G020 3888	Pin - Transfer Guide	35- 1
G020 3890	T/S Corona Recepacle	43- 29
G020 3896	Grounding Plate - Discharge Brush	35- 21
G020 3897	Discharge Brush - Transport	35- 18
G020 3910	Stay - Transfer Unit	35- 10
G020 3914	Bushing - Front Transfer Unit	35- 11
G020 3915	Bushing - Rear Transfer Unit	35- 12

Part No.	Description	Page and Index No
G020 3940	Guide - Transfer Roller Unit	35- 26
G020 4112	Bracket - Cleaning Roller	33- 21
G020 4128	Decal - High Temparature	35- 17
G020 4128	Decal - High Temparature	63- 7
G020 4129	Upper Fusing Cover	33- 5
G020 4130	Star - Fusing Unit	33- 8
G020 4133	Thermofuse - 169°C	33- 6
G020 4141	Fusing Unit Frame	33- 24
G020 4145	Pressure Lever - Fusing Unit	33- 13
G020 4146	Lower Entrance Guide	33- 26
G020 4147	Lower Exit Guide - Fusing Unit	33- 10
G020 4149	Upper Exit Guide - Fusing Unit	33- 1
G020 4151	Bracket - Fusing Connector	33- 29
G020 4152	Connector Bracket - Fusing Unit	33- 11
G020 4159	Rear Holder - Fusing Lamp	33- 25
G020 4161	Front Holder Fusing Lamp	33- 27
G020 4163	Heater Socket	33- 30
G020 4166	Front Fusing Cover	33- 9
G020 4170	Hot Roller	33- 17
G020 4173	Bushing - 36 mm	33- 16
G020 4174	C-ring - Hot Roller	33- 15
G020 4175	Bushing - Pressure Roller	33- 20
G020 4176	Bushing - Cleaning Roller	33- 23
G020 4177	Gear - 40Z	33- 18
G020 4178	Hot Roller Stripper	33- 2
G020 4179	Bracket - Hot Roller Stripper	33- 4
G020 4180	Pressure Roller	33- 19
G020 4185	Fusing Thermistor	33- 7
G020 4191	Pressure Spring	33- 12
G020 4193	Spring - Hot Roller Stripper	33- 3
G020 4330	Tightener Bracket	41- 20
G020 4331	Front Stud - 1 Bin Sorter	37- 5
G020 4332	Rear Stud - 1 Bin Sorter	39- 25
G020 4333	Tightener - 1 Bin Sorter	39- 22
G020 4390	Exit Roller	39- 33

Part No.	Description	Page and Index No.
G020 4409	Guide Plate - Feed Down	39- 26
G020 4411	Paper Exit Pawl	39- 12
G020 4412	Lower Transport Plate Ass'y	37- 17
G020 4413	Shaft - Transport Roller	37- 20
G020 4414	Transport Roller Ass'y	37- 10
G020 4419	Left Cover Tray	39- 2
G020 4423	Sub Copy Tray - FU	39- 1
G020 4424	Junction Gate - FU	39- 16
G020 4426	Exit Relay Roller	39- 8
G020 4427	Exit Roller - FD	39- 10
G020 4429	Exit Sensor	39- 28
G020 4431	Pressure Spring	39- 37
G020 4435	Pulley - 32Z	39- 20
G020 4436	Pulley - 28Z	39- 18
G020 4437	Timing Belt - B60S2M-386	39- 19
G020 4438	Timing Belt - B60S2M-292	41- 10
G020 4439	Junction Gate Solenoide - FD	39- 15
G020 4440	Tension Spring	39- 23
G020 4441	Idle Gear - 27Z	41- 16
G020 4442	Idle Gear - 27Z	41- 18
G020 4444	Tightener	39- 21
G020 4446	Spring Plate - Roller	39- 5
G020 4447	Pulley - 44Z	39- 24
G020 4449	Spring - Tighlener	41- 21
G020 4452	Right Vertical Guide	39- 4
G020 4453	Grounding Plate	39- 13
G020 4456	Pulley - 33Z	37- 23
G020 4457	Transport Roller - 1	37- 18
G020 4458	Transport Roller - 2	37- 19
G020 4459	Relay Guide - Transport Roller	37- 9
G020 4463	Roller Holder	39- 3
G020 4465	Harness Cover	39- 9
G020 4466	Bushing - M6	39- 7
G020 4467	Tension Spring	39- 36
G020 4468	Stay - FD	39- 14

Part No.	Description	Page and Index No
G020 4470	Front Spring Plate - Driven Roller	39- 35
G020 4471	Rear Spring Plate - Driven Roller	39- 34
G020 4473	Upper Transport Guide	37- 14
G020 4475	Guide Plate - Transport	37- 22
G020 4476	Guide Plate Holder	37- 4
G020 4477	Support Bracket - Transport Plate	37- 3
G020 4479	Bushing - 6 mm	37- 2
G020 4480	Fusing Knob	7- 20
G020 4480	Fusing Knob	37- 1
G020 4481	Grounding Plate - Exit Roller	39- 30
G020 4482	Middle Antistatic Brush - FD	39- 32
G020 4483	Antistatic Brush - FD	39- 31
G020 4484	Tightener	41- 19
G020 4487	Gear - 26Z	37- 11
G020 4488	Pulley/Gear - 45Z/20Z	41- 11
G020 4489	Gear - 24Z	37- 21
G020 4490	Paper Exit Sensor	37- 16
G020 4491	Roller Holder	37- 12
G020 4492	Knob - Guide Plate	37- 26
G020 4493	Magnet	37- 27
G020 5115	PCU Relay Board	47- 7
G020 5116	Inverter Unit Connector	47- 13
G020 5280	By-pass Feed Sensor	15- 9
G020 5402	Harness - Paper Exit	39- 17
G020 5403	Harness - Paper Size Detector	9- 17
G020 5404	Harness - PCU Detector	45- 16
G020 5408	Harness - Transport Sensor	21- 14
G020 5409	Harness - Paper End Sensor	21- 21
G020 5412	Harness - Fan Motor	45- 17
G020 5415	Harness - Humidity Sensor	49- 16
G020 5417	Harness - Registration Sensor	19- 28
G020 5434	Harness - Main Motor	41- 4
G020 5439	Harness - Polygon Mirror Motor	27- 7
G020 5477	Relay Harness - Total Counter	49- 2
G020 5486	Harness - Front Door SW	49- 6

Part No.	Description	Page and Index No.
G020 5486	Harness - Front Door SW	49- 31
G020 5494	Invertor Relay Harness	45- 21
G020 5497	Harness - Duplex Unit	47- 15
G020 5616	Main Switch	47- 21
G020 5625	Humidity Sensor	49- 17
G020 5626	Push Switch	35- 19
G020 5739	Power Pack - BCTD	45- 1
G020 5810	Bracket - Door Switch	49- 3
G020 5811	Safety Switch Actuator	49- 9
G020 5812	Microswitch	49- 23
G020 5813	Bracket - Magnet	49- 29
G020 5815	Actuator - Release Gear	49- 27
G020 5816	Bracket - Duplex Harness	47- 14
G020 5817	Bracket - OPU Switch	35- 20
G020 5818	Bracket - Drawer Connector	47- 10
G020 5829	Shoulder Screw - M3	47- 8
G020 5829	Shoulder Screw - M3	49- 30
G020 5835	Tension Spring	49- 4
G020 5839	Release Wire - Fusing Drive	41- 9
G020 5862	Support Bracket - Base	47- 22
G020 5870	Bracket - Power Pack	45- 5
G020 5871	Spacer - KGLS-12RF	45- 12
H521 3355	C Ring - Paper Feed Roller	43- 22

Part No.	Description	Page and Index No
A006 9104	Scanner Positioning Pin (4PCS/SET)	65- 1
A048 2838	Nylon Rivet	21- 17
A049 3371	Magnet	39- 27
A053 1957	Flex Hinge - Platen Cover	11- 6
A133 7112	Emblem (SVN)	7- 15
A133 7112	Emblem (SVN)	63- 9
A134 1072	Right Bracket - Grip Plate	51- 2
A134 1380	Emblem (GES)	7- 15
A134 1380	Emblem (GES)	63- 9
A134 1383	Emblem (RIC/LEN)	7- 15
A134 1383	Emblem (RIC/LEN)	63- 9
A139 9351	ROM Board 2	65- 2
A153 6423	Support Cover (INF)	7- 15
A153 9004	Wiping Cloth (for the Drum Charge RO)	65- 4
A157 2769	Rear Stopper Spring	17- 17
A184 3411	Chuck Spring	29- 11
A184 3420	Bottle Chuch	29- 17
A184 3421	Chuck Shaft	29- 16
A184 3422	Toner Slider	29- 7
A190 2702	Paper Guide	15- 8
A673 3881	Transfer And Separation Unit	35- 16
5215 1667	Platen Cover Stud	7- 9
5215 1980	Exposure Glass - A3T-3.2	7- 5
5215 2713	Bottom Plate Pad	15- 4
5353 1803	Wabe Washer	43- 35
5420 9507	Digital Multimeter	65- 6
5420 9516	Test Chart - OS-A3 (10 PCS/SET)	65- 5
5442 1924	Exposure Glass Cushion	23- 13
5447 2681	Snap Ring	15- 14
5447 2681	Snap Ring	19- 5
5447 2681	Snap Ring	21- 5
5448 2804	Platen Cover Sheet	11- 8

Part No.	Description	Page and Index No.
0242 0080B	Philips Pan Head Screw - M2X8	21-105
0313 0400B	Tapping Screw - M3x40	49-103
0353 0050F	Tapping Screw - M3x5	7-102
0353 0050F	Tapping Screw - M3x5	13-101
0353 0050F	Tapping Screw - M3x5	23-102
0434 0060B	Philips Tapping Screw - M4x6	51-103
0450 3008B	Tapping Screw - M3x8	37-104
0450 3008B	Tapping Screw - M3x8	39-101
0450 3010B	Tapping Screw - M3x10	23-103
0450 4012D	Tapping Screw - M4x12	11-101
0451 3006B	Tapping Screw - M3x6	15-101
0451 3006B	Tapping Screw - M3x6	19-101
0451 3006B	Tapping Screw - M3x6	21-101
0451 3006B	Tapping Screw - M3x6	23-101
0451 3006B	Tapping Screw - M3x6	25-101
0451 3006B	Tapping Screw - M3x6	33-101
0451 3006B	Tapping Screw - M3x6	35-101
0451 3006B	Tapping Screw - M3x6	37-102
0451 3006B	Tapping Screw - M3x6	39-104
0451 3006B	Tapping Screw - M3x6	41-101
0451 3006B	Tapping Screw - M3x6	43-101
0451 3006B	Tapping Screw - M3x6	45-101
0451 3006B	Tapping Screw - M3x6	47-101
0451 3006B	Tapping Screw - M3x6	49-101
0451 3006B	Tapping Screw - M3x6	51-101
0451 3006B	Tapping Screw - M3x6	61-176
0451 3006B	Tapping Screw - M3x6	61-187
0451 3008B	Tapping Screw - M3x8	21-104
0451 3008B	Tapping Screw - M3x8	25-104
0451 3008B	Tapping Screw - M3x8	47-108
0451 3010B	Tapping Screw - M3x10	33-103
0451 3014B	Tapping Screw - M3x14	9-103
0451 3014B	Tapping Screw - M3x14	41-103
0451 3014B	Tapping Screw - M3X14	43-103
0452 3008B	Tapping Screw - M3x8	27-101

Part No.	Description	Page and Index No
0452 3008B	Tapping Screw - M3x8	31-101
0452 3008B	Tapping Screw - M3x8	35-102
0452 3010B	Tapping Bind Screw - M3x10	27-102
0453 3014B	Tapping Screw - M3x14	25-103
0574 0050E	Hexagon Headless Set Screw - M4x5	43-106
0575 0050E	Hexagon Headless Set Screw - M5x5	25-102
0633 0120E	Spring Pin - M3x12	43-107
0720 0040E	Retaining Ring - M4	19-103
0720 0040E	Retaining Ring - M4	21-103
0720 0040E	Retaining Ring - M4	37-101
0720 0040E	Retaining Ring - M4	39-103
0720 0040E	Retaining Ring - M4	41-102
0720 0040E	Retaining Ring - M4	43-108
0720 0060E	Retaining Ring - M6	43-104
0802 5255	Tapping Screw - M3x8	7-101
0802 5255	Tapping Screw - M3x8	9-101
0802 5255	Tapping Screw - M3x8	49-102
0802 5256	Tapping Screw - M3x8	9-102
0805 0088	Retaining Ring - M6	35-103
0805 0088	Retaining Ring - M6	41-105
0805 3385	Bushing - 6 mm	19-102
0805 3385	Bushing - 6 mm	43-105
0805 3480	Bushing - 6 mm	21-102
0950 4006M	Philips Screw With Flat Washer - M4x6	33-102
0957 3008B	Philips Screw	39-102
1002 0307	Jumper Wire	61-100
1100 1474	Test Pin - Red	61-101
1102 3822	Connector - HIF3FC-20PA-2.54DSA	61-102
1102 4201	Connector - 2P	61-103
1102 4202	Connector - 3P	61-104
1102 4203	CT Header - 4P	61-105
1102 4204	CT Header - 5P	61-106
1102 4205	CT Header - 6P	61-107
1102 4207	Connector - 8P	61-108
1102 4209	CT Header - 10P	61-109

Part No.	Description	Page and Index No.
1102 4211	CT Header - 12P	61-110
1102 4619	Connector - 2P	61-111
1102 4620	CT Header - 3P	61-112
1102 4621	CT Header - 4P	61-113
1102 4623	CT Connector - 6P	61-114
1102 4631	CT Connector - 2P	61-115
1102 4634	CT Connector - 5P	61-116
1102 4643	CT Connector - 2P	61-117
1102 4648	CT Connector - 7P	61-118
1102 4818	Connector - 20P	61-119
1102 5007	CT Header - 14P	61-120
1102 5301	Connector - 2P	61-121
1102 5844	Connector - 5566-02A	61-122
1102 6245	Connector - 2P	35-104
1102 6295	Connector - 2P	61-123
1102 6300	Connector - 7P	61-124
1102 6303	Connector - 10P	61-125
1102 6304	Connector - 11P	61-126
1102 6515	Connector - 34P	61-127
1102 6662	Connector - 4P	61-128
1102 6895	Connector - 40P	61-129
1102 6957	Connector - 14P	61-130
1102 6958	Connector - 14P	61-131
1102 7324	Connector Header - 16P	57-101
1102 7383	Connector FC-102H	57-102
1102 7445	Connector - 46P	47-107
1102 7452	Connector DF11-22DP - 2V	57-103
1102 7453	Connector FX2-80S-1.27SVL	57-104
1102 7454	Connector FX6-60P-0.8SV2	57-105
1102 7455	Connector FX6-60S-0.8SV2	57-106
1102 7456	Connector 176125-5	57-107
1102 7463	Connector KX14-70K8D1	57-108
1102 7465	Connector IL-FHR-20S-HF	57-109
1102 7466	Connector IL-FHR-50S-HF	57-110
1102 7513	Header - 80P	61-132

Part No.	Description	Page and Index No
1102 7583	Connector - 5566-06A - RE	61-133
1104 0759	IC Socket 28P 2-382409-3	57-111
1105 0195	PCB Stud	47-102
1105 0239	Spacer	61-177
1105 0291	Wire Saddle	47-103
1105 0291	Wire Saddle	51-102
1105 0310	Wire Clamp	37-103
1105 0310	Wire Clamp	47-105
1105 0334	Edge - 17	47-104
1105 0344	Clamp	61-178
1105 0409	Spacer	61-179
1105 0415	Spacer - 12.7 mm	47-106
1105 0458	Clamp - LHL-18	43-102
1105 0460	Clamp	23-104
1105 0460	Clamp	41-104
1107 0472	Circuit Breaker - 250V/8A	47-109
1107 0898	Fuse 3216CP - 3A	61-134
1204 2373	Key Board Switch - SKQDPA	57-112
1204 2446	Main Switch	49- 11
1400 0390	TR 2SA1122D	57-113
1400 0392	Transistor - DTC114EK	57-114
1400 0398	Transistor - 2SC2412K	57-115
1400 0700	Transistor - DTD133HK	61-135
1400 0702	Transistor - DTD143EK	57-116
1400 0703	Transistor - 2SA1313	57-117
1402 0477	Silicon Diode - 1SS187	57-118
1402 0478	Diode - 1SS226TE85L	57-119
1402 0804	Silicon Diode - 45V - 0.3A	57-120
1402 1111	Diode - HZM5.1NB2	57-121
1402 1144	Diode - 150MW 1SS319	61-136
1402 1327	Diode - 2.0V	61-137
1403 0404	LED - SEL2110R	61-138
1403 0828	Diode - SEC1901C	57-122
1403 0829	Diode - SEC1201C	57-123
1407 1535	IC - TD62308AP	61-139

Part No.	Description	Page and Index No.
1407 1600	TTLIC - SN74LS244NS	57-124
1407 2143	TTLIC - 74F244SJ	57-125
1407 2187	TTLIC - SN74LS07NS	57-126
1407 2187	TTLIC - SN74LS07NS	61-140
1407 2219	IC - TD62003AP	61-141
1407 2561	TTLIC 74F157ASJ	57-127
1407 2948	IC - TC7S04F	57-128
1407 3263	IC - TC7S08F	57-129
1407 4179	CMOSIC TC7W04FU	57-130
1407 4322	IC - TD74ABT374F	57-131
1407 4323	TTL TD74ABT244A	57-196
1407 4336	PSRAM	57-132
1407 4536	IC - ICS1574	57-133
1407 4565	IC - TE6251	61-142
1407 4657	IC - RS5µF1050	57-134
1407 4671	FIFO M66256FP	57-135
1407 4683	MPU HD6413003TF-10	57-136
1407 4685	EEPROM LH28F800SUT-70	57-137
1407 4730	SRAM STK12C68-W45	57-138
1407 4734	IC - M66257FP	57-139
1408 0575	IC - M51957BFP	57-140
1408 0595	IC - NJM2904M	61-143
1408 0797	CMOSIC TC74HC03AF	57-141
1408 1065	Comparator BA10339F	57-142
1408 1204	IC - TA8083P	61-144
1408 1225	IC - STK672-040	61-145
1408 1226	Regurator 3.3V PQ3TZ53	57-143
1503 0587	Oscillator CX-5F 19.6608MHZ	57-144
1503 0704	Oscillator CSTCS16.00MX040	57-145
1600 1449	Resistor - 47 Ω 3W	61-146
1601 1413	Resistor - RCB8C330J	57-146
1601 1930	Resistor - 100 Ω ±5% 1/10W	57-197
1601 7751	Resistor - 4.7K Ω ±5%	57-147
1601 7752	Resistor - 10K Ω ±5%	57-148
1601 7792	Resistor - 1k Ω	57-198

Part No.	Description	Page and Index No
1601 7793	Resistor - 10k Ω	57-199
1601 7796	Resistor Array - 2.2k Ω ±5%	57-200
1601 7797	Resistor Array - 100 Ω ±5%	57-149
1601 7800	Resistor Array - 1K Ω ±5% 1/16W	61-147
1601 7801	Resistor Array - 10K Ω ±5% 1/16W	61-148
1601 7814	Resistor - 3.3k Ω ±5%	57-201
1604 4333	Capacitor - 100µF ±20% 10V	57-150
1605 0447	Capacitor - 10PF 50V	61-149
1605 0577	Capacitor - 0.33µF +80-20%	57-151
1607 0638	Ferrite Core - TFC25-15-12	47-110
1607 0705	Noize Filter - ACF51832-470	57-152
1607 0706	Noize Filter - ACF51832-220	57-153
1607 0723	Noize Filter - N2012Z121	57-154
1607 0732	Noize Filter - AEF321825-470	57-202
1607 0803	Filter - ACF451832-680	57-155
1607 0847	Data Line Filter - ACB1608H-300	57-156
1607 0907	EMI Filter - ACB2012H-300	57-157
1607 0926	Frilter - ACF321825-680	57-203
1607 0927	Frilter - ACF321825-220	57-204
1630 2221	Resistor - 220 Ω	61-150
1630 3102	Resistor - 1KΩ 1/10W ±5%	57-158
1630 3102	Resistor - 1KΩ 1/10W ±5%	61-151
1630 3103	Resistor - 10KΩ 1/10W ±5%	57-159
1630 3103	Resistor - 10KΩ 1/10W ±5%	61-152
1630 3150	Resistor - 15Ω ±5% 1/10W	57-160
1630 3154	Resistor - 150K 0HM ±5% 1/10W	61-153
1630 3220	Resistor - 22 Ω ±5% 1/10W	61-154
1630 3222	Resistor - 2.2K Ω 1/10W ±5%	57-161
1630 3243	Resistor - 24KΩ ±5% 1/10W	61-155
1630 3330	Resistor - 33 Ω ±5% 1/10W	57-162
1630 3332	Resistor - 3.3KΩ 1/10W ±5%	61-156
1630 3391	Resistor - 390 Ω 1/10W ±5%	61-157
1630 3471	Resistor - 470Ω - 1/10W	57-163
1630 3472	Resistor - 4.7KΩ 1/10W ±5%	61-158

Part No.	Description	Page and Index No.
1630 3820	Resistor - 82 Ω ±5% 1/10W	61-159
1630 4100	Resistor - 10 Ω ±5% 1/16W	57-164
1630 4101	Resistor - 100 Ω ±5% 1/16W	57-165
1630 4102	Resistor - 100 Ω ±5% 1/16W	57-166
1630 4103	Resistor - 10KΩ ±5% 1/16W	57-167
1630 4104	Resistor - 100 Ω ±5% 1/16W	57-168
1630 4105	Resistor - 1.0MΩ ±5% 1/16W	57-169
1630 4150	Resistor - 15 Ω ±5% 1/16W	57-205
1630 4222	Resistor - 2.2K Ω ±5%	57-170
1630 4223	Resistor - 22K Ω ±5% - 1/16W	57-171
1630 4273	Resistor - 27K Ω ±5% - 1/16W	57-172
1630 4301	Resistor - 300 Ω ±5% 1/10W	57-206
1630 4330	Resistor - 33 Ω ±5% 1/8W	57-173
1630 4332	Resistor - 33K Ω ±5% 1/16W	57-174
1630 4333	Resistor - 33K Ω: ±5% 1/16W	57-175
1630 4471	Resistor - 470 Ω ±5% 1/16W	57-176
1630 4472	Resistor - 4.7K Ω ±5% 1/16W	57-177
1630 4510	Resistor - 51 Ω ±5% 1/16W	57-178
1630 4680	Resistor - 68 Ω ±5% 1/16W	57-179
1632 3900	Resistor - 390 Ω ±1% 1/10W	61-160
1633 0000	Resistor - 0 Ω 1/10W - Jamper Chip	57-180
1633 1001	Resistor - 1K Ω ±1% 1/10W	61-161
1633 1002	Resistor - 10K Ω ±1% 1/10W	57-181
1633 1002	Resistor - 10K Ω ±1% 1/10W	61-162
1633 1201	Resistor - 1.2K Ω ±1% 1//10W	61-163
1633 3301	Resistor - 3.3K Ω ±1% 1/10W	61-164
1633 3901	Resistor - 3.9 Ω ±1% 1/10W	61-165
1633 3921	Resistor - 3.92K Ω ±1% 1/10W	57-182
1633 4700	Resistor - 470 Ω - ±1% - 1/10W	61-166
1633 4701	Resistor - 4.7K Ω ±1% 1/10W	61-167
1634 0000	Resistor - 0 Ω - 1/16W	57-183
1640 5101	Capacitor - 100µF ±20% 50V	61-168
1642 1101	Capacitor - 100µF ±20% 16V	61-169

Part No.	Description	Page and Index No
1642 1470	Capacitor - 47µF ±20% 16V	61-170
1643 5100	Capacitor - 10µF ±20% 50V	61-171
1644 0220	Capacitor - 22µF ±20% 10V	57-184
1644 0470	Capacitor - 47µF ±20% 10V	57-185
1644 2100	Capacitor - 10µF ±20% 25V	57-186
1644 5100	Capacitor - 10µF ±20% 50V	57-187
1644 6220	Capacitor - 22µF ±20% 6.3V	57-188
1660 1100	Capacitor - 10PF 50V	57-189
1660 3101	Capacitor - 100PF 50V	57-190
1660 3150	Capacitor - 15PF 50V	57-191
1660 3471	Capacitor - 470PF 50V	57-192
1660 3471	Capacitor - 470PF 50V	61-172
1660 7103	Capacitor - 10000PF 50V	57-193
1660 7103	Capacitor - 10000PF 50V	61-173
1660 7104	Capacitor - 100000PF 50V	57-194
1660 7104	Capacitor - 100000PF 50V	61-174
1660 9104	Capacitor - 0.1µF 25V	57-195